

A HISTORY OF THE USE AND  
MANAGEMENT OF THE  
FORESTED LANDS OF ARIZONA,  
1862-1936

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A HISTORY OF THE USE AND MANAGEMENT OF THE  
FORESTED LANDS OF ARIZONA, 1862-1936

by

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CHAPTER I  
INTRODUCTION

The history of the use and management by the National Government of the public lands of Arizona, and of the resources thereon, is of significance because it extends over a greater period in proportion to the life of the territory and the state than has commonly been the case in western areas.<sup>1</sup>

While in the nation as a whole, less than twenty percent of the forested lands are in any form of government ownership or control,<sup>2</sup> the timber lands of Arizona have been controlled almost entirely by the Federal government ever since the territory was organized in the middle of the 19th century. The Federal government owns and controls 98.3% of the acreage of forested lands lying within the boundaries of Arizona, distributed as follows:<sup>3</sup>

|                     |       |
|---------------------|-------|
| National Forests    | 64.9% |
| Indian Reservations | 30.7% |
| National Parks      | 2.3%  |
| Public Domain       | 0.4%  |

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1. Dates for organization of territories in the west, and for granting statehood follow: Arizona and New Mexico, 1868 and 1912; Nevada, 1861 and 1864; Colorado, 1861 and 1876; Idaho, 1868 and 1890; Wyoming, 1868 and 1890; Utah, 1861 and 1896.

2. Kellogg, R.S., "The Timber Supply of the United States," Forest Service Circular No. 166, p. 12.

3. U.S. Forest Service, Interoffice Statistics, Southwestern Region, for 1935.



Of the fraction remaining, 0.7% is in state ownership, and 1% in private ownership. This condition has existed throughout the entire history of the region.

#### Relation to Major Industries

The administration of the grazing resources of the public domain is vitally connected with the development of one of the most important industries of the state, stock raising, which is dependent to a considerable degree for its cheap forage upon the use of natural ranges on the public lands and the national forests. The administration of the timber resources is closely connected with the development of the lumber industry.

#### Limits of Thesis Problem

Forests on the Indian Reservations comprise 30.7% of the total timber resources of Arizona. Since 1910 the Bureau of Indian Affairs has maintained a distinct organization for the administration of forests on Indian lands. The full discussion of the use of the forest resources on the Indian Reservations of Arizona has no place in this study, inasmuch as they do not comprise a "state" asset, the reservations being virtually a state within a state.

Forests on lands reserved for National Parks are administered strictly for their aesthetic and recreational value. They are not available for any form of commercial development, nor are they subject to cutting, except that necessary

for their protection from fire and insect damage, or to grazing of livestock.<sup>4</sup>

The scope of this study is limited to a consideration of management and use in those forests administered by the United States Forest Service, since they alone, of the four classes of timbered lands in government ownership, comprise a genuine state resource, available for various forms of use by the public and commercial interests. Conservation for use is the objective, and the needs of citizens of Arizona are given prior consideration over those of individuals or industries outside the state.

#### Problems of Management

The problems involved in the management of forest lands are those of conservation of the timber, management of the range, and protection of the watersheds. This thesis deals only with the history of the first two problems. It does not include a study of the reclamation question, except in its incidental relationship to forest management for watershed protection, nor does it include a consideration of the broad aspects of the range problem, i.e. its relation to the agricultural development of the state, and its relation to the problem of administration, by the Department of the

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4. Butler, Ovid, American Conservation in Picture and in Story, p. 76, and U.S. Statutes at Large, Vol. 34:225.

Interior, of the ranges on the unreserved public domain.

### Method of Treatment

This study is limited to the tracing of the development of forest management practices for the national forests of Arizona, in relation to the general administration of the public lands, and the growth of the major industries of the state; with a discussion of the primary problems involved in such control, timber conservation, range management and improvement, and watershed protection, and a presentation of the changing public opinion within the area.

The history of the management of the forested lands of the territory is a history of the struggle between two principles. At the opening of the period, freedom for individual use is general; at the close of the period, control for the general good is the accepted practice. This struggle for the retention of freedom in the face of extending governmental control can be traced in the pioneer opinion and sentiment of the individuals living within the region, as conservation was gradually extended under Federal control.

### Source Materials Used

In studying the course of forest use and management in Arizona from 1862 to 1936 a great variety of sources have been consulted. For the period of Territorial history, the greatest wealth of material has been found in various publications of the United States Government; descriptions of the

nature of the territory and its resources are found in publications of the Bureau of Ethnology, of the Geological Survey, of the War Department, of the Commissioners of the General Land Office, of the Department of the Interior, and the reports of the Territorial Governors of Arizona. Some information as to local sentiment on various governmental policies has been found in the records of Congressional debates and committee reports on proposals for legislation, or requests for the withdrawal of laws already passed.

For the period from 1905 to 1936 the best official document sources have proved to be the reports of investigations of the Public Lands Commission, reports of the Secretary of Agriculture, and of the Forester, the special publications of the Bureau of Forestry being, naturally, the most fruitful. In addition to the general bulletins and circulars issued by the Forest Service, access has been had, through the office of the Regional Forester at Albuquerque, New Mexico, the office of the Supervisor of the Coronado National Forest, and the Director of the Southwestern Forest and Range Experiment Station in Tucson to various types of unpublished materials, inter-office reports and statistics, which have been most valuable.

In addition to the publications of the various agencies of the United States Government, the publications of the American Forestry Association have been used freely. From them much valuable material has been secured, particularly

for the chapters on timber management and range control.

General works have been consulted in the study of the public land and forest policies of the United States, although it has been almost impossible to secure bibliographical material of this type for state policies. With but five known exceptions, New Jersey, New York, Pennsylvania, Wisconsin, and California, no states appear to have published studies of forest management as a phase of State history. The general works used for National policies deal almost wholly with the passage of laws in Congress, and not with the application of those laws in the field. As a consequence of this situation, there have been few precedents to be followed in choice of material for inclusion in a history of the State's forestry, or for the organization of the selected data.

The public opinion within the state on the application of the various conservation laws and regulations has been considered not only most interesting, but also the most essential inclusion in this study, since the Federal forest laws are intended to be broad enough to apply to all the forests, and hence, in themselves, would not indicate the importance or general extent of a given condition within this particular area. Only by tracing local reaction to those laws, or by learning what conditions existed at the time of their passage, can the conservation story of the territory and the state be discovered.

Most of the information on state sentiment with respect to forest problems has been gathered either from the Reports of the Territorial Governors, and the speeches or memorials of the state's representatives in Congress, or from the columns of the Southwestern Stockman, Farmer and Feeder, a weekly publication for the Arizona stockgrowers, both sheep and cattlemen, which was issued almost without interruption, although with several changes in editorship, from 1884-1931. This publication carried frequent editorials on forestry and grazing questions from 1900 to 1924, letters from its readers, and replies to their criticisms over the signatures of Forest Service officials, reports of speeches made by the Foresters of the Department of Agriculture to various bodies, and official announcements of the Forest Service to the users of the national forests, as well as reports of Conventions of the Arizona Wool-Growers Association, the Arizona Cattle-Growers Association, the National Live Stock Association, and other similar organizations.

This publication has been used in preference to the newspapers of more general type, because it seemed to represent more completely, and with more continuity, the views of the particular groups most concerned with the development of Governmental control over the forest lands of the state.

## CHAPTER II

### THE FOREST LANDS OF ARIZONA

#### Original Extent and General Character

Although a semi-arid state, originally more than one-fifth of the land area of Arizona was covered with true forests.<sup>1</sup>

#### General Character of Arizona's Forests

There are five main forest types in continental United States, the Northern, Southern, Central, Rocky Mountain and Pacific Coast types, each with its distinctive characteristics. The forests of Arizona are of the fourth, or Rocky Mountain type, which is also found in Idaho, Montana, Wyoming, Utah, Colorado and New Mexico. This type of forest occurs chiefly on the higher plateaus and mountain slopes and is almost entirely coniferous.<sup>2</sup>

Although this is the predominant forest type in Arizona, the timber resources of the state form "a vast mosaic whose patterns are counterparts of many of the forest types of North America."<sup>3</sup> The spruce, fir, and aspen forests of

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1. See chart and graph comparing forested areas of eleven western public land states, by acreage and by percentages. Data taken from The Forestry Almanac (1926).

2. Kellogg, R.S., "The Timber Supply of the United States," Forest Service Circular No. 166 (1909), p. 3.

3. Cooperrider, C.K., "Arizona and Its Heritage: The Forests," Univer. of Arizona, General Bulletin, Vol. 7, No. 3, (1936) p. 54.

# FORESTED AREAS OF 11 WESTERN STATES, 1925

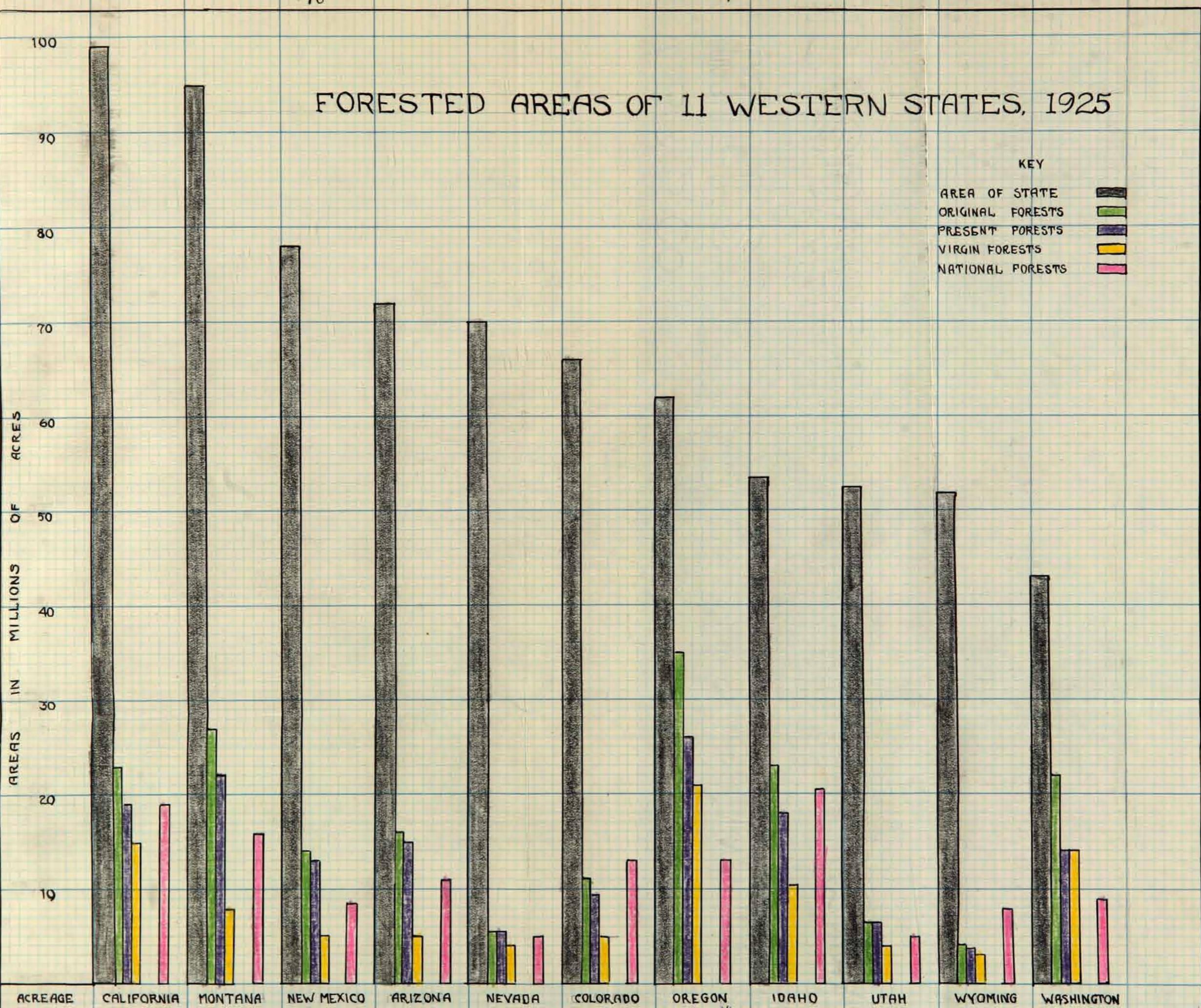


TABLE 1.

COMPARISON OF FORESTED AREAS OF ELEVEN WESTERN STATES, 1925

| State<br>Area- acres     | Original<br>Forests | Present<br>Forests | Virgin<br>Forests | National<br>Forests |
|--------------------------|---------------------|--------------------|-------------------|---------------------|
| California<br>99,617,280 | 23,000,000          | 19,000,000         | 15,000,000        | 19,181,508          |
| Montana<br>94,196,480    | 27,200,000          | 22,246,000         | 8,200,000         | 15,933,889          |
| New Mexico<br>78,401,920 | 14,528,000          | 13,000,000         | 4,628,243         | 8,482,315           |
| Arizona<br>72,838,400    | 16,320,000          | 15,200,000         | 4,775,000         | 11,234,670          |
| Nevada<br>70,285,440     | 5,500,000           | 5,500,000          | 4,000,000         | 4,976,889           |
| Colorado<br>66,239,000   | 11,000,000          | 10,000,000         | 4,978,000         | 13,249,150          |
| Oregon<br>61,887,000     | 35,200,000          | 26,100,000         | 21,200,000        | 13,137,447          |
| Idaho<br>53,688,000      | 22,940,000          | 18,393,333         | 10,655,000        | 20,485,156          |
| Utah<br>52,597,760       | 6,500,000           | 6,500,000          | 4,000,000         | 7,463,703           |
| Wyoming<br>52,460,160    | 3,415,600           | 3,415,600          | 3,355,200         | 8,426,927           |
| Washington<br>42,775,000 | 22,000,000          | 14,100,000         | 14,100,000        | 9,356,000           |

PERCENTAGE COMPARISON

| State      | Percent Area<br>Originally Forested | Percent of Present Forests<br>now National Forests |
|------------|-------------------------------------|--|
| Oregon     | 57.0                                | 50.0   |
| Washington | 50.0                                | 68.0   |
| Idaho      | 44.0                                | 100.0  |
| Montana    | 29.0                                | 73.0   |
| California | 23.0                                | 100.0  |
| Arizona    | 22.2                                | 73.0   |
| New Mexico | 18.0                                | 65.0   |
| Colorado   | 16.6                                | 100.0  |
| Utah       | 12.3                                | 100.0  |
| Nevada     | 7.8                                 | 90.0   |
| Wyoming    | 6.6                                 | 100.0  |

Data taken from Forestry Almanac, 1926.

the White Mountains (near Springerville and the Kaibab country) represent the higher Rockies and the far North. The Douglas fir forests, such as that on Mt. Graham, represent forests in parts of the Pacific North West, and the dense forest of cork-bark fir which grows near Hanagan Meadow, where the Coronado Trail between Springerville and Clifton crosses the Blue Ridge, is peculiar to the Southwest and characteristic of lofty mountain tops where rainfall is exceptionally high for the region concerned, but temperature is modified by great areas of surrounding low, warm country. Ponderosa, or yellow, pine forests which resemble trees in the pine woods of the south, and forests of the same kind of trees that are found widely distributed through the Pacific Coast and Rocky Mountain ranges, from British Columbia and the Black Hills south to Mexico occur on the high mountains and plateaus throughout the state.

#### Territory Described by Explorers and Travellers

Early explorers and travellers in this region of the Southwest have left few accounts which give us descriptions of the forests of the country, and its general character. Those who have done so, however, draw interesting pictures of the territory's forest resources before the destructive hand of the settler and stockman was laid upon trees and grass. One of the earliest accounts is that found in the Spanish records which report the investigations of the Friar

Marcos de Niza, who was sent to verify the reports of Cabeza de Vaca as to what lay beyond the mountains north of Mexico. Friar Marcos set out in March, 1539, from Culiacan, New Galicia. By May of that year he had reached the borders of the wilderness country in and about the present White Mountain Apache Reservation in Arizona.<sup>4</sup> In describing the country, he says he found it "... 'a most plain soyle, without trees or stones ... where there is no foode.' Yet the Indians gave him 'nutttes of Pine trees' to eat - the pinon nut, still a staple food of the Southwest Indian."<sup>5</sup> Further, we learn from Winship's translation of the records of Suarez de Peralta who, fifty years after the event, wrote an account of the de Niza expedition, that "for wood, they burnt very large walnut trees which bear quantities of walnuts better than those of Spain. They have many mountain grapes which are very good eating, chestnuts and filberts, according to the way he [de Niza] painted it, this should have been the terrestrial paradise. For game there were partridges, geese, cranes, and all other winged creatures - it was marvelous what was there." And then Suarez adds, "he told the truth in all this, because there are mountains in that country, as he said, and herds, especially of cows

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4. Winship, G.P., The Coronado Expedition, 1540-42. U.S. Bureau of Ethnology, 14th Annual Report, Part I. p. 355.  
5. Butler, Ovid, American Conservation in Picture and in Story, p. 19.

... There are grapes and game, without doubt, and a climate like that of Spain."<sup>6</sup>

Castenada, who was a member of Coronado's party in 1540 describes land in the vicinity of the present Fort Grant, Arizona, in the following words:

The rest of the country is all wilderness covered with pine forests. There are great quantities of pine nuts. The pines are two or three times as high as a man before they send out branches. There is a sort of oak with sweet acorns of which they make cakes like sugar plums with dried coriander seeds ... Watercress grows in many springs, and there are rosebushes, and pennyroyal, and wild marjoram. There are barbels and picones like those of Spain in the rivers of this wilderness. Gray lions and leopards were seen.<sup>7</sup>

Coronado himself, in writing to his friend, Mendoza, on August 3, 1540, said, "We found fresh rivers and grass like that of Castile, and especially one sort like what we call scaramoio, many nut and mulberry trees but the leaves of the nut trees are different from those of Spain."<sup>8</sup>

If these reports seem too glowing in their tales of grapes and nuts, wild roses and water cress, there are those of later travellers and official explorers who were, perhaps, personally less interested in advertising an "earthly paradise."

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6. Winship, op. cit., p. 364-365. The Spanish text translated by Winship may be found on pages 144 and 148 of Zaragoza's edition of Suarez de Peralta's Tratado.

7. Ibid., p. 517. Winship has not determined the species of fish referred to as barbels and picones, but the lions and leopards were respectively the mountain lions and jaguars.

8. Ibid., p. 555.

Even before the purchase by the United States of the southern portion of the territory from Mexico, a military reconnaissance of the lands along the Del Norte and Gila Rivers had been made in 1846-7, by the advance guard of the Army of the West, under the leadership of Lieutenant Colonel W. H. Emory. Describing lands in the Pinon Lano Mountains [now a part of the Crook National Forest] ( $33^{\circ} 14'$  Latitude and  $110^{\circ} 45'$  Longitude) he says:

In the ravines we found, at places, a luxuriant growth of sycamore, ash, cedar, pine, nut-wood, mezcal, and some walnut, the edible nut again, Adam's needle, small evergreen oak and cottonwood, and a gourd, the cucumis perennis. There was every indication of water, but none was found on the surface; it could, no doubt, have been found by digging, but the Gila was only 20 miles distant.<sup>9</sup>

Still another idea of the topography of the territory is found in the record of Captain Sitgreaves' journey down the Colorado River in 1854. In October of that year the expedition was in the San Francisco Mountains.

Occasional patches of white clover were met with, and the singular cedar first seen when crossing the Zuni Mountains. The trunk is large and low, with wide-spreading branches, and the bark, several inches thick, is corrugated like that of the oak. The camp overlooked a wild and picturesque canon. Tall pines, oaks, and the low spreading cedar were mingled so as to produce a park-like effect, heightened by glimpses through the vistas of the sheep and mules grazing on the rich grama grass that grew up and concealed the sharp black

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9. Emory, W.H., Military Reconnaissance from Fort Leavenworth, Missouri, to San Diego, California, 1846-7, p. 74.

fragments of trap that covered the ground ...<sup>10</sup>

The whole country traversed from the San Francisco Mountains was barren ... It consists of a succession of mountain ranges and desert plains, the latter having an average height of about 5,000 feet above the level of the ocean. The larger growth, almost exclusively cedar, was confined to the mountains, and the scanty vegetation of the plains, parched by a long drouth, furnished few specimens for the botanists ....<sup>11</sup>

The arable land bordering upon the river (the Colorado) is greatly encroached upon by extensive flat spurs, hard, gravelly, and destitute of vegetation, which reach far out into the valley, leaving a comparatively small proportion of the space between the mountains susceptible to cultivation. Some large cottonwood trees grow directly upon the river banks, but the growth of the rest of the valley is small, consisting chiefly of mesquit, tornilla, willow, and a singular tree with a smooth, pale green bark and leaves so diminutive as to require close proximity to discern them. The shrubs are the arrowwood, wild sage, creosote, and greasewood, so called from the brilliancy of its flame while burning. Cacti are not numerous, the most remarkable is the pitahaya, or cereus giganteus.

Only two kinds of grass were found, at rare intervals, and in small quantities, a tall, coarse variety growing in large tufts and a smaller kind having a perceptible incrustation of salt upon the leaves ....<sup>12</sup>

These later descriptions picture the region in more familiar terms than do those of the Spanish explorers, and it is interesting to learn how, bit by bit, the unknown areas of this southwestern territory were explored and

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10. Sitgreaves, L., Report of an Expedition Down the Zuni and Colorado Rivers, p. 13. This land is now included in the Coconino National Forest.

11. Ibid., p. 18.

12. Ibid., p. 21-22.

mapped, and exhaustively reported upon to the government at Washington, and then to residents of the eastern states who were eager to find new frontiers for development.

In 1857-1858 the Ives expedition of United States Topographical Engineers explored the Colorado River of the West. This territory had never been explored thoroughly. The Spanish in the 16th Century had traversed portions of it; one of Coronado's party had explored the river in the region of the Grand Canyon, but most of the parties did not proceed many miles above the mouth of this great river. From the middle of the 18th Century, when two Jesuit missionaries traversed a part of its course, the river was scarcely approached until 1850 when routes to California became important.<sup>13</sup>

The object of the Ives reconnaissance was the determination of navigable possibilities and routes for transportation of supplies to posts in New Mexico and Utah. They proceeded upstream from Fort Yuma by steamboat. Of the Colorado plateau, the report says:

We now entered the region of pines. The growth was thicker, and trees of considerable size began

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13. Ives, J.C., Report upon the Colorado River of the West, Explored in 1857-58 by order of the Secretary of War. p.20-21.

Fr. Sedelmayer, in 1744, followed the course of the Gila to its junction with the Colorado. Fr. Escalante, in 1776, travelled from Santa Fe to Utah, and from Salt Lake came southwest toward the source of the Virgin, crossed the Colorado at a point almost the same as that reached from the opposite direction by Cardenas in 1540.

to be mingled with the low cedars. The ascent from Hualpais spring, though gradual, had been rapid, and the barometer indicated an altitude of about 6,000 feet.<sup>14</sup>

Again, in 1871, the War Department sent a corps of engineers under George M. Wheeler to explore and survey these areas in Arizona and Nevada. The existence of extensive forests on the fringe of the high mountains and plateaus was noted, and also that the grand Colorado plateau was immense in size and covered over a great share of its surface with pine forests and parks.<sup>15</sup>

The woodlands of the Colorado plateau are described in some detail; the dense growth of juniper in the Black Forest, the pines and scrub oaks near Bill Williams Mountain, and the heavy growth of pine and juniper along the road from Camp Verde to Camp Apache which was in a heavily wooded district.

The Mogollon Mountains and the country near the east and west forks of White Mountain river are covered with pine and juniper. The Natanes mesa is well wooded and also the Pinal Mountains, farther south; the creek of that name is bordered with cottonwoods, and near its source a few oaks are found, and generally the mountain country north of the site of Camp Pinal is more or less heavily wooded with pine and juniper. In the country to the south and along the Gila, cottonwoods are found near the river, while mesquit and palo verde grow farther back, on the edge of the

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14. Ibid., p. 103.

15. Wheeler, G.M., Preliminary Report Concerning Explorations and Surveys principally in Nevada and Arizona, 1871, p. 23.

mesa beyond this only stray mesquit and grease-<sup>16</sup>  
wood are noticed, and an occasional palo verde.

Agricultural and grazing lands received quite careful description, for by this time the east was interested in finding new agricultural areas. The rich farm lands of the middle western plains were being taken up rapidly. Those who wanted free land were almost ready to move into the semi-arid and arid regions. So we find reports that:

In Arizona, in and around Prescott, along the valley of the Upper Gila, Salt and Verde Rivers, south of Tucson along the Santa Cruz River and Sonoita Creek there is an area capable of sustaining quite an agricultural population; some of the finest soil I have ever seen has lately been broken up along the Gila, and around the settlement called Florence .... It is safe also to say that the time is close at hand when these areas will become great grazing grounds ....<sup>17</sup>

The Colorado plateau, particularly that part over which my route extended, is covered with a fine growth of nutritious grasses, and in time, when the Indians are sufficiently subdued to permit it, this whole country will afford as fine facilities for raising stock as any country I have ever visited on the Pacific Slope. The supply of water is sufficient for vast herds ....<sup>18</sup>

By the seventies, settlers and travellers through the area began to send out reports of the country. Most of them gave quite accurate pictures of the region, and not a few wrote with the intention of attracting industries to the territory. Such an individual was one Elias Brevoort who,

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16. Ibid., p. 72.

17. Ibid., p. 31.

18. Ibid., p. 72.

in 1874, described the resources of New Mexico Territory along the 35th parallel of latitude, the projected route of the Atlantic and Pacific railroad. A considerable amount of forested land had been included in the grant made to that company in 1866, with the provision for "forty and fifty mile limits" on either side of the route.

The true pine belt of the interior portion of the continent ranges between six and ten thousand feet above the sea; here it secures the needful moisture in the form of rain, dew, or winter snow, and is also naturally associated with the protruded granite rocks which form the central nucleus of the higher ridges. It would be difficult to conceive of a more convenient distribution of these pine forests for railroad construction or transportation than that presented on the line of the 35th parallel.<sup>19</sup>

The San Francisco Forest reaches 400 miles in length, from the 107th to 114th parallel of longitude [from 109th to 114th being in Arizona]. It is from 30 to 100 miles in breadth, and is the largest block of forest land south of the 40th parallel. Along the creeks are black walnut, sycamore, and cottonwood, and in the valleys and on the plains valuable mesquite ... near the Rio San Pedro, en route from Sulphur Springs to Upper Crossing, there is a dense growth of acacia constricta, mesquite and dwarf pines; near the cienega is a luxuriant growth of saccatone on the flats. The creosote plant is the prevailing vegetation on the hills.<sup>20</sup>

Sylvester Mowry, in his "Memoir of the Proposed Territory of Arizona," enforces his own statements about the richness of the territory by quoting the words of earlier explorers in the region, whose accounts were calculated to

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19. Hinton, R.S., The Handbook to Arizona, p. 341.

20. Ibid.

encourage the development of the region.

We are in the pleasantest region we have seen since leaving the Choctaw country. Here are clear rivulets, with fertile valleys and forest trees. The wide belt of country that borders the Black Forest and probably extends along the Rio Verde to the Salinas and Gila bears every indication of being able to support a large agricultural and pastoral population. The valley of the Rio Verde is magnificently wooded with firs and oaks affording excellent timber.<sup>21</sup>

Quoting from Gray's reports to the Secretary of the Interior of the survey of the Mexican boundary for the Treaty of Guadalupe Hidalgo, Mowry describes the region of the Rio San Pedro thus:

It passes through the most desirable region, with the hills and mountains for 40 miles containing inexhaustible quantities of timber. We noticed tall cedar, and oaks of every description, one kind more interesting than the others being a white oak from 20 to 40 feet in the body. Pine and spruce, with superior white ash and walnut, were found, and the most gigantic cottonwoods, particularly on the Sonoita ....<sup>22</sup>

These descriptions cover forested areas of varying character. What one may not at first easily comprehend is that one of the largest stretches of unbroken forest in the country lies in the bounds of Arizona, the forest belt of the Mogollon Plateau, extending from north of Williams, southeasterly for about 300 miles air-line, almost to the

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21. Mowry, Sylvester, Memoir of Proposed Territory of Arizona, (1857) p. 9. The author quotes from Wheeler's Report of a survey for a Pacific Railroad, Vol. III, p. 93.

22. Ibid., p.22.

Rio Grande in New Mexico.<sup>23</sup> "As the forests of the world are reckoned, this great forest of the Southwest is not old; its tallest veteran may have sprung from a cone brushed aside by the boot of Coronado on his adventurous marches."<sup>24</sup> The average tree in this forest is reckoned by experts to be about 250 years old, and the bulk of the forest is "ripe," mature and ready to decline in vigor and growth.

Within the boundaries of Arizona are found great contrasts in climate and resources. The shifting sands and scant vegetation of the southern deserts; the high mountains and plateaus of the north, with their forests and rich minerals; the fertile valleys of the central region, with agricultural possibilities of great worth when given water. These are some of the factors which determined the state's development.

#### Groups Interested in Conservation

This development was largely accomplished by three groups; the miners, who found what they sought in the mountains and were dependent for the ease of development of their mines upon the ready accessibility of timber; the

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23. The National Forests of Arizona, U.S. Department of Agriculture, Circular No. 318 (1924) p. 1.

24. Hall, Sharlot M., "The Forests of Arizona" Out West Magazine, Vol. 25 (1906) p. 476.

stockmen, who succeeded best on the more level ranges, and who desired the free use of the grass on the public lands for their private profit; and the farmers, who took their stand in the river valleys, chiefly of the central region, and, with the aid of irrigation, raised crops. The interest of the farmers in the problem of forest conservation arose from their greater interest in the conservation of water for irrigation, for the two problems are closely interrelated.

For these reasons, conservation sentiment, favorable and unfavorable, was voiced by the miners and the stockmen whose interests most often seemed to cut across the interests of forest conservation.

#### Problems Encountered

From 1891 to 1936, the problems encountered have been those of regulation for the greatest good of those engaged in mining and range-cattle raising, while at the same time protection of the rights of other citizens of the area to the use and enjoyment of the forests and range is secured. Much of the story is found in the territorial history, for during the period of Territorial government over two-thirds of the area of the state was reserved for special uses by

the Federal Government;<sup>25</sup> Indian reservations first, as a step in the subjugation of the tribes who were so dangerous to the peaceful settlement of the land by whites; and, later, forest reservations to protect the resources of timber from exploitation, and the water sources from destruction or confiscation.

#### Present Extent of Forest Reserves

In 1935, 11,389,464 acres of the unreserved forest lands of the state were included in the national forests. The original forested area of the state, including woodlands, is estimated to have been approximately 16,320,000 acres, its present forested area approximately 15,200,000 acres, with over 4,775,000 acres still in virgin forests, in which no cutting has ever been done.<sup>26</sup> The policy of early reservation followed by the Federal government has protected from denudation and exploitation approximately nine-tenths of the original forested areas, and one-fourth of the virgin timber. Few other states have been so fortunate.

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25. U.S. Forest Service, Southwestern Region, Statistics, Sept. 1, 1935. Total Government domain on that date was 69.12%; 30.21% Indian Reservations; 15.63% Forest Reservations; 3.00% Reclamation withdrawals; .04% Military Reservations; .72% National Monuments; .86% National Parks and 18.64% Public land.

26. American Tree Association, Forestry Almanac, 1926, p.227.

### CHAPTER III

#### NATIONAL LEGISLATION FOR USE OF PUBLIC DOMAIN, 1862-1912

##### Acts to Promote Settlement

It has been said that the story of governmental forest administration in America is nine-tenths background, for it has had a gradual development, touching every point of the story of the nation as a whole. Without that background, which is to be found in the history of public land administration, the story is brief and hardly comprehensible.<sup>1</sup> For that reason a brief review of the legislation passed by the Federal Government, regulating the use and development of the land resources of the nation, and the effect of that legislation upon the forests, particularly in the Territory of Arizona, seems essential before passing to the consideration of early conservation measures.

Throughout the history of the United States it has been the established policy of the government so to administer the public lands as to increase settlement, promote ownership of homes, and the development of resources by private enterprise and individual effort. Had this policy been continued during the last fifty years, as it operated during

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1. Cameron, Jenks, The Development of Governmental Forest Control in the United States, p. 2.

the greater part of the 19th century, it is probable that most of the public domain would now be in the hands of the people, excepting only those areas which they deemed too worthless for entry to be made profitably.

The type of individual which so eagerly entered the frontier areas soon, of itself, created conditions which required regulation. Resources of all sorts, but particularly the forests, were ruthlessly exploited with no thought for future needs, or future generations. The sentiment of many of these men may be found in the words of one, who, in Senate debates on a conservation measure, said:

I do not believe there is either a moral or any other claim upon me to postpone the use of what nature has given me, so that the next generation or generations yet unborn may have an opportunity to get what I myself ought to get.<sup>2</sup>

For the first seventy-five years of national history, there was little attempt on the part of the government to regulate entry on the public domain. Men could advance at will upon the unoccupied frontier, select lands suited to their personal desires, clear them by any method they chose, and acquire ownership by simple occupation. This system was not efficient; conflicting claims were frequently made, lands were occupied only long enough, in some cases, to strip them

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2. Senator Teller of Colorado, Congressional Record, 60th Congress, 2nd Session, Vol. 43, Part 4, Feb. 26, 1909, p. 3225.

of valuable products, such as lumber or minerals, and were then abandoned fairly worthless in the eyes of later comers. Lack of surveys and orderly methods of acquiring title discouraged the more conservative man from settling in a new region.

Homestead Act, 1862

To remedy these and other disadvantages in the prevailing system of free entry, and to encourage more rapid western development, the Congress passed, on May 20, 1862, "An Act to Secure Homesteads to Actual Settlers on the Public Domain."<sup>3</sup> In accordance with the motives, the act provided that:

... any person who is the head of a family, or who has arrived at the age of 21 years, and is a citizen of the United States, or who shall have filed his declaration of intention to become such ... and who has never borne arms against the United States government, or given aid and comfort to its enemies, shall, from and after the first January, 1863, be entitled to enter one-quarter section or a less quantity of unappropriated public lands, upon which said person may have filed a preemption claim, or which may, at the time the application is made, be subject to preemption at \$1.25 or less, per acre; or 80 acres or less of such unappropriated lands at \$2.50 per acre, to be located in a body ... after the same shall have been surveyed ....

Under this Act, as was anticipated, thousands of homesteads were filed upon throughout the trans-Mississippi west.

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<sup>3</sup>, U.S. Statutes at Large, Vol. XII, p. 392. Section 1 cited.

Beneficial as it may have been in hastening agricultural development, it is considered, so far as the operation of it affected forest and timber lands, to have had scarcely a mitigating feature. It was wholly inapplicable, from the viewpoint of conservation, yet it applied. It promoted perjury and profits among a large number of adventurers. The forests were easily procured by the lumberman.<sup>4</sup>

Arizona, in common with other Western states, suffered some exploitation of her forests as a result of this act, yet not to such great extent as did states on the Pacific slope.

#### Desert Land Act, 1877

In 1877 it was clear that the provisions for 160 acre homesteads made in the Act of 1862 were not satisfactory in the case of arid, semi-desert lands requiring irrigation before they could be developed as farms. On March 3 of that year an act was passed to remedy this situation by permitting 640 acre entries upon "desert lands," with the understanding that water would be conducted upon them within three years in sufficient quantity to grow crops.<sup>5</sup> It was not the intention to permit the filing of such claims upon timbered lands, and while there is some record of infractions of the

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4. Hibbard, B.H., History of Public Land Policies, p. 409.  
5. U.S. Statutes at Large, Vol. XIX, p. 377.

rule, the worst abuse occurred in the segregation of valuable grazing lands which had independent water supplies. Ten years after its passage, the Surveyor-General of Arizona reported to the Commissioner of the General Land Office that:

Speculators of all degrees have now turned their attention to the facilities offered by the desert land law, .... Stockmen could and did get hold of range land by desert entry, paying the required \$.25 per acre. In this manner they had the land for three years and then might sell their interest in it .... Hearings in contested cases and examinations by special agents have disclosed a want of any attempt to irrigate the land in many instances ... and that lands taken up under this act are often used for stock grazing.<sup>6</sup>

From the passage of this act to the end of the fiscal year 1912 original entries made under the act totalled 1,928,879 acres, while final entries were made on only 246,392 acres.<sup>7</sup> While there exists no means of determining at this date what percentage of the uncommuted and unperfected claims were fraudulently entered, in the light of the Surveyor's reports, it is probable that a fairly large percentage of the unperfected entries were in that category.

#### Timber and Stone Act, 1878

The abuses resulting to forest and grass lands under

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6. Hibbard, op. cit., p. 429. Citations from Land Office Reports of 1884, p. 8, and 1885, p. 73-75; 1887, p. 522.  
7. General Land Office, Report of the Commissioner, 1912.

the so-called "Homestead" and "Desert Land" Acts were insignificant in comparison with those resulting from two laws passed the following year. On June 3, 1878 Congress passed an act authorizing the citizens of Colorado, Nevada, and the territories to "fell and remove timber from the public domain for mining and domestic purposes." At the same time another act was passed providing for the sale, at not less than \$2.50 per acre, of public lands valued chiefly for timber and stone, non-mineral in character.<sup>8</sup> The motive for the passage of the so-called "Timber-Cutting Act" was to prevent the illegal cutting so common at that period, and at the same time to provide for the needs of settlers. The result, however, was that no way was left, after the passage of these two acts, by which timber for commercial purposes could be honestly obtained from a considerable portion of the public lands. Inevitably the failure to provide by law for the purchase of timber land by the lumber interests resulted in their being secured by fraud.<sup>9</sup> Extensive depredations were made upon the public forests under cover of this law. The Commissioner of the General Land Office, in his report for 1882, stated that "depredations upon the public timber by powerful corporations, wealthy mill-owners, lumber companies

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<sup>8</sup>. U.S. Statutes at Large, Vol. XX, p. 88.

<sup>9</sup>. Ise, John, United States Forest Policy, p. 79.

and unscrupulous monopolists ... are still being committed to an alarming extent ..." and again, in 1886, the same officer reported "... an immense pressure brought to bear upon the legislative and executive branches of the government to the end of securing immunity for past, and unlimited privileges for future, spoliations of the public timber lands, all ostensibly urged in the interest of bona fide 'agriculturists' or 'miners', but notoriously, in fact, to forward gigantic schemes of speculation and monopoly in the remaining forests of the United States."<sup>10</sup>

The motives for passing the "Timber and Stone" Act were to give the settler in addition to his 160 acres of cultivable land, a needed wood-lot to supply timber for his domestic use, and to make available a supply of wood for local, commercial use.<sup>11</sup> The abuses of its provisions were frequent and serious. Lumber operators foresaw that the value of fine timber would be constantly increasing. They therefore began to take advantage of the timber and stone entry provisions to acquire the best forests in the West by allowing the public to know that they would purchase certain timber land from anyone who might enter it under the law

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10. General Land Office, Report of the Commissioner, 1882 and 1886, p. 102. Cited also by Hibbard, op. cit., p. 464. The force of this pressure may be estimated from the reports of Senate debates on the measure, Congressional Record, 45th Congress, 2nd Session, Vol.7, Part 4, April 25, 1878, p. 2842 ff.

11. Hibbard, op. cit., p. 465.

of 1878.<sup>12</sup>

Specifically, abuse of the act by the Old Dominion Copper Mining and Smelting Company of Arizona is cited in this connection in the report of the Commissioner of the Land Office for the year 1901. He charges that this company cut several million feet of lumber in 1900 and 1901 from land never proved to be mineral.<sup>13</sup>

Abuse occurred also by the stockmen, who managed to secure, under the guise of stone lands, vast tracts actually desired for grazing.<sup>14</sup>

In 1891 the act was amended, but its history after that year was essentially the history of the earlier period repeated. It resulted in the concentration of timber ownership in the hands of the speculators and large companies. Its harmful effects were continually brought to the attention of Congress. Hardly a year passed during which the reports by the Secretary of the Interior and the Commissioner of the General Land Office did not recommend its repeal, yet Congress did nothing.

#### General Revision Act, 1891

The Act of March 3, 1891 provided for the general re-

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12. Report of National Conservation Commission, 1909, Senate Executive Document No. 676, 60th Cong. 2nd Session, Vol. I, p. 87.

13. General Land Office, Report of Commissioner, 1901, p.98-99.

14. Ibid., 1909, p. 69.

vision of various laws concerning the public domain and of the status of timber culture claims made under the law of March 3, 1873, and an amended law of June 14, 1878. This law had provided for the growth of timber on western prairies. There were 1152 original entries in Arizona under the act, covering 164,806 acres, although only 52 claims, covering 7,149 acres, were perfected during the period of its operation, and 74 covering 10,223 acres, were commuted to cash.<sup>15</sup>

The greatest significance of this act of 1891 is not, however, in the changes made in the timber culture law, but rather in the provision, in Section 24 thereof,<sup>16</sup> for the creation by proclamation of the first national forest reservations. Inasmuch as the whole development of the Forest Reserve system had its rise in this important section of the General Revision Act of March 3, 1891, it is cited in full.

That the President of the United States may, from time to time, set apart and reserve in any State or Territory having public land bearing forests, in any part of the public lands wholly or in part covered with timber or undergrowth, whether of commercial value or not, as public reservations, and the President shall, by public proclamation, declare the establishment of such reservations and the limits thereof.

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15. General Land Office, Report of Commissioner, 1912, p.153.  
16. U.S. Statutes at Large, Vol. XXVI, p.1103.

This act definitely provided for national ownership of forest lands, and was a complete departure from the forest policy previously pursued, yet it was faulty in one important respect. It failed to provide for the protection and administration of the reserves and the forestry movement was consequently charged, in the ensuing years, with "locking up" from use the forest resources of the country.<sup>17</sup>

In 1892 there occurred debates in Congress upon two propositions affecting the public domain. Marcus A. Smith, the Delegate from the Territory of Arizona, participated in both. When the so-called "Permit Act of 1891" was to be amended to include the territories of Arizona and New Mexico under its provisions<sup>18</sup> for free timber not only for mining, agricultural and domestic purposes, but also for manufacturing, Delegate Smith presented the bill in such a way that it passed both houses without opposition of any sort.

In June of the same year a debate was held on the "Act to Repeal the Timber Culture Laws, and for other purposes" which had for one of its objects the provision that, where good faith had been shown, and eight year's work done, claims might be patented without regard to the trees then

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17. Butler, Ovid, American Conservation in Picture and Story, p. 48.

18. U.S. Statutes at Large, Vol. XXVII, p. 444.

growing. Marcus A. Smith, states that "opposition to this bill arises from ignorance of existing conditions, and from a desire on the part of some persons to prevent the future development of the public lands for fear that there may be increased competition in the present great output of this country in cereals."<sup>19</sup>

#### Acts to Promote Conservation of Forests

##### Act of June 4, 1897 Forest Lieu Section

The next enactment affecting public lands and forests was the forest lieu section of the Act of June 4, 1897<sup>20</sup> which provided that, where an unperfected claim or patent was included within a forest reservation, the settler or owner might relinquish the tract and select another outside of the reserve. This act was manifestly unfair to the government, for worthless land of all kinds was relinquished, in some cases land naturally valueless; in other cases timber land stripped of all merchantable timber.<sup>21</sup>

##### Act of March 3, 1905 Repeal of Forest Lieu Selection Law

In 1905 this privilege of lieu selection was withdrawn,

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19. Congressional Record, 52nd Cong. 1st Session, Vol. 23, Pt. 6, June 29, 1892, p. 5636.

20. U.S. Statutes at Large, XXX, p. 34-36.

21. Ise, op. cit., p. 176.

except that contracts previously entered into by the Secretary of the Interior were not impaired.<sup>22</sup> In Arizona, the lands for which selections were yet to be made under prior contracts were chiefly those of the Santa Fe Pacific Railroad,\* the Aztec Land and Cattle Company, the Saginaw and Manistee Lumber Company, William F. Baker, and Edward B. Perrin. These were the odd numbered sections, within the San Francisco Mountains Forest Reserve, which were part of the original railroad grant, and a few odd-numbered sections within the Grand Canyon Forest Reserve also owned by the Santa Fe Railroad. On June 30, 1905, it was estimated that there were 221,116 acres in the San Francisco Mountain Reserves available as selection bases.<sup>23</sup>

For fifteen years after passage of the Act of 1891 creating the first reserves, there was considerable opposition to the segregation of the huge timbered tracts on the part of those who desired to cultivate the valley and meadow lands to be found in them. The agitation for the opening of the agricultural lands was constant, and finally, in 1906, a measure for such relief was passed.

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22. U.S. Statutes at Large, XXXIII, p. 1264, and Report of Commissioner of General Land Office, 1905, p. 327.

23. General Land Office, Report of Commissioner, 1905, p. 326-327. \*The name of the railroad is quoted exactly as given in the Report of the Commissioner although it is now known as the Atchison, Topeka and Santa Fe Railroad.

Opening of Agricultural Lands, Act of June 11, 1906

The Act of June 11, 1906 followed conservation ideals, and left the opening of such lands to the discretion of the Secretary of Agriculture.<sup>24</sup> Prior to its passage there was lengthy debate in the House which makes clear how some settlers in the West viewed the policy of the government's reservation of forest lands. The remarks of Representative Mondell from Wyoming, and of Representative Hogg from Colorado, show the irritation of certain men over the rapid extension of the reserves.<sup>25</sup>

Representative Mondell stated that:

... the necessity for this legislation ... arises from the fact that, in violation of the spirit of the forest reserve law, in my opinion, if not the letter of that statute, forest reserves have been extended over territory more valuable for agricultural purposes than for forest reserves ... the opposition to the reserves in the West has been in the main -- that portion of it at least which is best founded -- to the inclusion of great areas of grazing lands and of some considerable areas of farming lands ...

That such views were held, also, in the Territory of Arizona may be inferred from the ironical remarks of Marcus A. Smith, who ventured to assert that there was no longer room left in the West for more reserves -- every patch of sagebrush or straggly mountain cedar in his Territory already

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24. U.S. Statutes at Large, Vol. XXXIV, p. 233.

25. Congressional Record, 59th Cong. 1st Session, Vol. 40 Pt. 6 April 17, 1906, p. 5393.

having been made part of some reservation.

Representative Hogg of Colorado, in the same debate, diagnosed the difficulty in these words:

The trouble with the administration of forest reserves is that we have got at the head of the institution ... a theorist from beginning to end in regard to the operation of the forest reserves. Apparently they think more of a tree or a piece of sagebrush than they do of an American citizen out there. They will take in areas absolutely barren of trees and call it a forest reserve ...

This Act was the last of the series in this period which concerned primarily the public lands. Next to be considered are those acts directly affecting the forest and range lands.

### The Early Conservation Measures

#### Prevailing Attitude in Nation and Territory

The prevailing sentiment on the question of conservation throughout the first hundred years of national history was that of laissez faire. Were not the resources inexhaustible? Were they not there for the use and enjoyment of the settler? The government felt itself playing the role of an agent, holding title to the land and its resources merely until the people should desire it.<sup>26</sup> For that reason early proposals for the conservation of timber

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26. U.S. Department of Agriculture, Annual Report of Secretary, 1907, p. 161.

and mineral resources for the use of later generations were not given much attention. Conservation sentiment grew very slowly among men who felt that the future inhabitants had no claim upon the wealth which was present here and now.

While there was no considered forest policy until 1891, there had been a few attempts at saving, for the government, the use of certain types of timber in the forests of the eastern United States. In 1817 the first national law setting apart public lands for the purpose of drawing supplies of timber therefrom for the use of the Navy was passed.<sup>27</sup> It was subsequently amended by the Act of May 15, 1820,<sup>28</sup> and at that date provided:

That the Secretary of the Navy be authorized, and it shall be his duty, under the direction of the President of the United States, to cause such vacant and unappropriated lands of the United States as produce the live oak and red cedar timbers to be explored, and selection to be made of such tracts, or portions thereof, where the principal growth is of either of said timbers as in his judgment may be necessary to furnish the navy a sufficient supply of said timbers .... And the tracts of land thus selected ... shall be reserved ... from any future sale of the public lands, and be appropriated to the sole purpose of supplying timber for the Navy of the United States.

Under this act about 19,000 acres of live oak forest containing about 37,000 live oak trees fit for naval use, were

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27. U.S. Statutes at Large, Vol. III, p. 347.

28. Ibid., p. 607.

reserved in Louisiana.<sup>29</sup>

An act had previously passed on February 25, 1799,<sup>30</sup> making an appropriation for the purchase of timber and of lands on which timber was growing, for the use of the navy, and subsequently, on March 19, 1828, another act<sup>31</sup> made an appropriation for the purchase of more of such timber lands. These two acts had no relation to public lands, and were only for the acquirement of material for the present and prospective needs of the navy. They did not mark the beginning of a considered policy.<sup>32</sup>

The law of March 1, 1817, for the selection and reservation of timber lands was followed by other acts in line with its provisions.<sup>33</sup> While these laws provided for setting apart and protecting certain public lands, there was no legislation looking toward the establishment of forests for general use for another sixty years after the passage of the last act in the naval reservation group on March 2, 1831, and in 1858 the total set aside under these acts did not exceed 244,452 acres.<sup>34</sup>

The agitation for administration of the forests on the public domain in accordance with the requirements of a

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29. Department of Agriculture, Report on Forestry, 1877, p.10.

30. U.S. Statutes at Large, Vol. I, P.622.

31. Ibid., IV, p.256.

32. Butler, op. cit., p.33.

33. Acts of February 23, 1822, March 3, 1827, and March 2, 1831.

34. Department of Agriculture, Report on Forestry, 1877, p.10.

conservation program for the future began in 1871, with the introduction in the Forty-second Congress, Second Session, of the first comprehensive forestry bill (H.R. 2197). This bill failed to pass, as did others subsequently introduced. A bill to inaugurate a system of administration of the forests on the public domain was introduced in the Senate in the same session of Congress (S. 609) but likewise failed to pass. (This bill, distinguished as the initial effort on the part of the Department of Interior to establish a national forest system, embraced in the main the principal features of forest administration which were finally adopted in the Act of June 4, 1897.)<sup>35</sup>

In 1891, the Secretary of the Interior secured the insertion of a brief clause into the General Revision Act of March 3. This was the "Section 24" previously cited, which gave authority to the President to establish forest reservations by proclamation.<sup>36</sup>

After the passage of the Act of June 4, 1897, no further laws for the development of forest administration were made until February 1, 1905.<sup>37</sup> The act of that date besides providing for the transfer of forest reservations from the Department of the Interior to the Department of Agriculture.

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35. General Land Office, Report of Commissioner, 1900, p.113.  
36. U.S. Statutes at Large, Vol. XXVI, p.1103.  
37. U.S. Statutes at Large, Vol. XXXIII, p.628.

and ordering them designated thereafter as "national forests" rather than "forest reserves" also stipulated that forest supervisors and rangers should be selected, when practicable, from qualified citizens of the States and Territories in which the reserves were situated; and that all persons employed in the Forest Service and National Park Service had the authority to arrest, without process, any persons found in the act of violating the laws, rules and regulations of those services.<sup>38</sup>

On March 1, 1911 the Weeks Act<sup>39</sup> was passed. It provided for the cooperation of the several states and territories with the United States for the protection of watersheds of navigable streams and contemplated passage by the states of laws for forest fire protection. In the case of Arizona this act has not been of great importance, since other arrangements for cooperation had already been made by the Territory and the Federal Government. These will be considered in a later chapter.

The act of greatest importance among these various measures for conservation was that of March 3, 1891. The Territory of Arizona was among the first to benefit by its provisions. The Grand Canyon Forest Reserve was created by

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<sup>38</sup>. Ibid., p. 700.

<sup>39</sup>. U.S. Statutes at Large, Vol. XXXVI, p. 961.

Executive Proclamation on February 20, 1893, with an original area of 1,851,520 acres. Later, in 1905, it was enlarged to 2,307,520 acres, but in 1906 it was reduced to 2,257,920 acres.

The San Francisco Reserve of 975,630 acres was first set aside on August 17, 1898. This reserve included only even-numbered sections, the odd-numbered sections being railroad property, or belonging to private individuals. In 1905 this reserve was enlarged to 1,975,310 acres.

Next in order of reservation was the Black Mesa, originally containing 1,658,880 acres, enlarged in 1906 to 2,030,240 and in 1907 to 2,572,249 acres; the Prescott, of 10,240 acres created May 10, 1898, and enlarged October 21, 1899 to an area of 423,680 acres as a result of a petition from settlers in the region. In 1907 it was still further enlarged by the addition of 251,170 acres, making a total area of 743,488 acres. The Santa Rita was created April 11, 1902, with an area of 387,300 acres which was enlarged November 5, 1906 to 490,558 acres; the Santa Catalina was established July 2, 1902, with an acreage of 155,520, and in 1907 it, too, was increased to a total area of 406,690 acres. Mt. Graham Reserve was established on July 22, 1902, with an area of 118,600 acres, increased in 1907 to 140,880 acres; Chiricahua on July 30, 1902 with an original area of 169,600 acres, enlarged on November 5, 1906 to 287,520 acres;

Pinal Mountains Reserve was created on March 20, 1905, with an area of 45,760 acres; Tonto on October 3, 1905, with 1,115,200 acres to which, in 1907, 1,288,320 acres were added, giving a total area of 2,449,280 acres. At this time the Pinal went out of existence as a separate reserve.

Baboquivari was created on November 5, 1906, with an area of 126,720 acres; Huachuca on November 6, 1906 with 314,125 acres; Tumacacori on November 7, 1906 with 203,550 acres; Dragoon on May 25, 1907 with 69,120 acres; Dixie with 626,800 acres and Verde with 721,780 acres were set aside during the fiscal year 1908.

Most of this later group were incorporated into the present Coronado.<sup>40</sup>

By the close of the fiscal year of 1908 there were seventeen national forests in the territory, covering 13,163,710 acres. In 1909 the Commissioner of the Land Office reported that there were very few timber lands of any value left which were not within a national forest, and the exceptions were unsurveyed tracts not subject to entry.<sup>41</sup>

When a comparison is made of the area of the original

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40. Dates of formation, and data on areas of the forests are taken from the Reports of the Commissioners of the General Land Office for those reserves established prior to 1905, and from the Reports of the Chief of the Bureau of Forestry to the Secretary of Agriculture subsequent to 1905.

41. General Land Office, Report of Commissioner, 1909, p.69.

forests of the Territory (estimated to have been 16,320,000 acres)<sup>42</sup> with the area reserved by Executive Proclamations up to the close of the fiscal year 1912 (set at 12,462,257 acres exclusive of all alienated agricultural lands within the boundaries)<sup>43</sup> it can be readily understood that opposition was inevitable.

### Reaction to Extension of Government Regulation of Forests and Lands

#### Opposition Groups

There were three groups in the Territory who were vitally concerned with the extension of government control of the forests and the grazing lands included in the national forests. They were the miners, the farmers, and the stockmen. Their interests were largely economic. In addition to the opinions held by various representatives of these three industries, there were opinions, chiefly opposing, expressed by minor groups among the population.

The petty causes for hostility to the extension of the system were largely based on economic arguments, also. The reduction in land office advertising was resented by many small newspaper publishers; the effect upon the profits of

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42. Forestry Almanac, op. cit.

43. Department of Agriculture, Annual Report, Bureau of Forestry, 1912, p. 473.

the professional land locators, who had made a business of entering lands in the interests of timber companies, cattle companies, and speculators, called forth their protests.<sup>44</sup>

The people were well acquainted with Indian Reservations and, when they first heard of forest reserves, naturally concluded that the two were practically one and the same. They felt that the government had created the forest reserves for the express purpose of circumscribing the rights of settlers<sup>45</sup> and then, as later, the catchwords of the anti-conservationists were "feudal estates," "paternalism," "landlordism," and "bureaucracy."<sup>46</sup>

In addition to these causes for opposition, there was the resentment felt over the Eastern personnel of the Service; the employees of the Service were called arrogant and violent, and were accused of conducting the Service for their personal aggrandizement. It was charged that no benefit came except to a favored few from the new system of control.<sup>47</sup> This charge against the personnel was evidently made frequently, for in 1905, when a native Arizonan, A. F. Potter, who had had practical experience on the ranges, was appointed there was great satisfaction among the stockmen

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44. Ise, op. cit., p. 191.

45. Breen, F.S., "Forest Reserves as Seen at Close Range," Forestry and Irrigation, Vol. 13, (1907), p. 181.

46. Editorial, Forestry and Irrigation, Vol. 14, (1908), p. 393.

47. Editorial, Ibid., p. 445-7, and F.S. Breen, op. cit., p. 180.

who felt that, now, "the Forestry Department could be counted on for doing things about right in managing the reserves and making the best possible use of their resources."<sup>48</sup>

The opinion among the miners of the Territory was divided. During the first few years after passage of the act authorizing the creation of the forest reservations, miners were entirely shut out.<sup>49</sup> This resulted in much bitterness. The opposition of the miners in the western territories and states was largely responsible for defeating the McRae bill in 1891.<sup>50</sup> This bill proposed to protect the reserves, to permit the sale of timber to the highest bidder at not less than the appraised value, to authorize the Secretary of War to detail troops to protect the reserves from depredation, and to restore to entry any agricultural land in them. Receipts from sales were to be used for protection of the reservations. Mining interests feared this bill, which would have deprived them of free timber. But an even greater fear was that, the reserves having not yet been opened to mining, any provision for their protection would result in shutting them out altogether. In the judgment of one authority it was, without a doubt, the opposition of the miners which caused a large share of the hostility to the

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48. Southwestern Stockman, Farmer and Feeder, Editorial, June 2, 1905.

49. Ise, op. cit., p. 130.

50. Ibid., p. 125.

Forest Reserves in general.<sup>51</sup>

Some miners in the Territory, however, realized the importance of conserving timber for their future needs. On June 19, 1899, numerous citizens of Yavapai County presented a petition to the Federal Government, asking that the lands within a radius of fifteen miles of Prescott be set apart as a forest reserve in order to save, for the use of the immediate community, the timber thereon which was being rapidly swept off by large mining corporations operating at some distance.<sup>52</sup> The area which it was proposed to reserve was a mineral country. Mines would be opened in the future which would add material wealth to the county. If, however, the conditions then existent were to prevail, these distant mines, already producing fabulous wealth outside the area, would destroy the possibilities favorable in that region to the development of local mines. It was stated that numerous small mines in the region were already closed because the locality had been denuded of its timber, which was being cut under the Act of June 3, 1878. The petitioners stated that "nothing can avert ultimate destruction (of the forests) except timely government intervention with a Forest Reserve ...." The worst offender in

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51. Ibid.

52. General Land Office, Report of Commissioner, 1900, p. 80-81.

this wholesale destruction of timber near Prescott was the United Verde Mine at Jerome which, in a two year period, consumed over 60,000 16-foot mining timbers, representing at least 40,000 thrifty, growing pines averaging from 12 to 20 inches in diameter.<sup>53</sup> These, not including a large number used by the Congress and other outside mines, aggregated a number which, with the constantly increasing demand, would soon have entirely devastated the Prescott forests.

#### Approving Groups

The Prescott petition recognized also the value of the forests for water conservation. The 360,000 acres which comprised the proposed reserve were recognized by the petitioners as constituting an important watershed. The streams draining this area were tributaries of the Verde, Salt, and Gila Rivers and the petitioners, who claimed to represent 90% of the inhabitants of the area, and thousands of residents in the agricultural valleys below who were viewing with "well grounded alarm the deforesting of the watersheds of the rivers and tributaries from which they drew their supply of water for irrigation," cited the already inadequate water supply, its annual reduction, and the pressing need for control of the forests to protect their farming

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53. Ibid., p. 83.

operations.<sup>54</sup>

The water problem, in its relation to the forests, was made the basis of recommendations for government conservation in almost every report of the Territorial Governors from 1893 to 1910. Typical of these requests is one made in 1903:<sup>55</sup>

That appropriate measures be taken looking to the rejuvenation of the depleted forest area in this Territory and that a system of tree and tree seed planting be inaugurated by the Division of Forestry in order that the watersheds of the various streams in the Territory may be kept unimpaired as sources of water supply.

Writing of the importance of forest reservations to water conservation, one authority says that:

... nowhere is it more important than in Arizona and Southern California, where the scarcity of water and its utilization for purposes of irrigation give it enormous value ....

It is to a large measure the reservations of these regions and the preservation of their forest cover that give such great value to the adjacent cultivated fields. It is the water and not the land that has value. It is the perennial supply, flowing from the reserved and unreserved forests of East and Central Arizona that has in the past two decades rescued the Salt River Valley from its former barrenness ... and transformed it into one of the most fertile and productive areas in America.<sup>56</sup>

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54. Ibid., p. 83.

55. Report of the Governor of the Territory of Arizona, 1903, p. 206.

56. Toumey, J. W., "Our Forest Reservations," Popular Science Monthly, Vol. 59, (June 1901), p. 125-126.

The importance of the forest reservations to range control was recognized clearly after the great drouth of the nineties. The careful management of grazing within the national forests was very evident during that period, and subsequently, in 1907, the cattlemen asked for a further extension of such regulations. But before they had arrived at this point of view, they held other views quite contrary. The opposition from certain stockmen was bitter from the time of the first attempt to regulate grazing which, before the national forests were created, had been free to all; the stronger men, of course, crowding out the weaker in many sections. When, in February, 1899, Senator Warren of Wyoming presented a petition to Congress praying that grazing in the national forests be allowed without any restriction, Marcus A. Smith presented a similar memorial from the Legislature of Arizona Territory.<sup>57</sup>

In the columns of the outstanding stockman's publication for the Territory (The Southwestern Stockman, Farmer, and Feeder) the hostile attitude of the early years is constantly reflected.

In 1901 the charge was made that restriction of the size of the herd, by assignment of proportional areas of

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57. Congressional Record, 55th Cong. 3rd Session, Vol. 32, Pt. 2, Feb. 13, 1899, p. 1781 and Feb. 14, p. 1879.

range, would prevent profitable expansion and favor the large stockman unduly.<sup>58</sup>

In 1903 it was charged that the treatment accorded the sheepmen in the north was unfair and prejudiced.<sup>59</sup> For this and other reasons the cattlemen were urged to organize to protect their interests.

The steady extension of the reserves which occurred during the decade from 1895 to 1905 called forth protests. Santa Cruz County stockmen, for example, resented the creation of the Huachuca and Tumacacori Reserves, and from the columns of the Bisbee Evening Miner, the editor of the Stockman quotes:<sup>60</sup>

They declare that with the various landgrants it will just about wipe Santa Cruz County right off the map so far as the use of the public domain for grazing may be concerned.

By 1907 the cattle and sheep men seem to have recognized the inevitability of the control, and from this time on there was less and less hostile criticism; the Service was improving rapidly, and the needs of local areas were being given careful attention. Joseph H. Kibbey, the Territorial Governor, in his report to the Secretary of the Interior for 1907 indicates this.<sup>61</sup> He says:

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58. Southwestern Stockman, Farmer, and Feeder, Oct. 11, 1901, p. 1.

59. Ibid., Jan. 10, 1902, p. 8.

60. Ibid., Dec. 28, 1906.

61. Report of the Governor of the Territory of Arizona, 1907, p. 28.

... possibly in no other section of the United States is there so keen an appreciation of the value of forests as in Arizona, nor is it possible for the National Administration to meet anywhere more loyal support than is accorded in this Territory to the policy of protecting the forest domain. Our people have learned through years of observation what it means to have natural growth removed from the soil. They have seen overstocking of the ranges and forests followed by denudation ... and the loss of nature's system for holding water in the soil. They have seen cattle trails become water courses for the run-off of floods, the gashes thus made in the soil becoming deep ravines ... that quickly drain districts of rainfall. Such developments are of moment in a country in which water is of precious value for irrigation and for stock on the ranges, and very naturally the people of Arizona have been led to study with care the question of conserving the waters and saving the forests.

In each instance the action of the President in creating National Forests in this Territory, in late years at least, has met with the heartiest local approval.

No forests are owned by the Territory, if we except the school sections and university lands which happen to be within National Forests, nor is there any desire that the Federal Government shall relinquish any of its ownership and control of the forests. On the contrary, it is probable that in some cases it will be to the advantage of the Territory to relinquish to the Federal Government the school sections within National Forests and accept in exchange agricultural or grazing lands which have a certain rental value ....

Judging from the records of official and popular opinions on the question of government control, it seems fair to conclude that the sentiment in Arizona, if not entirely in harmony with the Governor's interpretation of it, was no more bitter nor prolonged, and possibly less in quantity, than that in most of the other western states and

territories where a comparable percentage of the forest domain was reserved.

## CHAPTER IV

### NATIONAL LEGISLATION FOR ADMINISTRATION AND USE OF THE NATIONAL FORESTS

The history of the use and management of the National Forests of this and other states has now been traced in a general way through the evolution of public land and conservation policies. The problems of use and management of the timbered lands on the public domain have been those of administering the resources for the greatest good of those living in contiguous territory, and interested economically in their use, while, at the same time, assuring their protection and conservation for the benefit of citizens of later generations. The primary motive for the public land laws of the period from 1862-1897 was the promotion of agricultural settlement, while that of the early conservation laws, 1891-1905, was the protection of the resources of the land for future needs.

Opposition to Federal control of the land and its resources arose chiefly through conflicts with economic interests. The earliest charge was that the government forest reservations "locked up" from use the resources which should be freely available to the individuals then

in the areas concerned,<sup>1</sup> without consideration for the needs of later generations.

Charges that the rights of settlers were circumscribed resulted in forcing the opening to entry of agricultural lands included in the reserved areas. In like manner, the exclusion of miners from the national forests in the first few years after their creation resulted in agitation for the privilege of prospecting for minerals, and for priority rights to entry and development of the lands contained therein. It is not surprising to find that almost every valid complaint against the methods of administering the national forests received some satisfaction, either in laws passed by Congress, or by Department regulations, for the administration and control of the forests. These laws must be examined in the light of the motives for their passage, and the way in which they functioned.

### Methods of Creating National Forests

#### Executive Proclamation

The first law permitting the creation of forest

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1. Pinchot, Gifford, speech at Denver, Colorado, March 17, 1909, quoted in Southwestern Stockman, Farmer and Feeder, March 19, 1909.

reserves by executive proclamation was passed in 1891. The rapid creation of reserves in the ensuing years aroused the ire of mining, lumbering, and agricultural interests, by checking their exploitation of the resources on these lands. In 1897 the mining and agricultural interests secured some modification of the original act. After that year no national forests were to be established except to improve and protect the forest within the boundaries, to secure favorable conditions of water-flow, and to furnish a continuous supply of timber for the use and necessities of citizens. The inclusion of lands more valuable for their minerals, or for agricultural purposes, than for forest purposes was no longer even indirectly authorized.<sup>2</sup> The President was given power to suspend, revoke, or modify any previous proclamations, as he deemed best in the public interest; such modifications might reduce the area, change the boundaries, or vacate altogether the order creating the forest.<sup>3</sup>

With the passage of time, there were changes made not only in the executive's power of proclamation, but also in the methods for creating forests. The original powers of Presidential proclamation of forests gave the executive

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2. U. S. Code, Title 16, Sec. 475, Act June 4, 1897.

3. U. S. Code, Title 16, Sec. 473, Act June 4, 1897.

almost unrestricted authority.<sup>4</sup> In 1907, 1910, and again in 1912, this power was diminished by excluding certain states and territories, in which forests were to be created only by act of Congress. In 1924 it was further decreased. After that year the President was authorized to establish as national forests, or parts of national forests, only those lands which, in the opinion of a National Forest Reserve Commission (representing the Secretary of Agriculture and any other departments of the government which were concerned) were suitable for the production of timber.<sup>5</sup>

The rights and powers conferred in the laws for the establishment of national forests were not left unchallenged. Judicial decisions were required before certain of the rights were clarified. In 1904 the scope and purpose of forest reservations was construed by the United States Circuit Court for Arizona to be the preservation of the remaining forests on the public lands of the United States from depredation and destruction, and to accomplish this object all lands within the forest reservations ought to belong to the United States.<sup>6</sup>

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4. The President could set apart and reserve as National Forests, in any state, or territory having public land bearing forests, in any part of the public lands wholly or in part covered with timber or undergrowth, whether of commercial value or not, any amount of land he deemed desirable.

5. U. S. Code, Title 16, Sec. 471, Acts of Mar. 3, 1891; Mar. 4, 1907; June 25, 1910; Aug. 24, 1912 and June 7, 1924.

6. Ex parte Hyde (C.C. Cal. 1904) 194 F. 207.

The term "public lands" was not always used in the same sense in phrasing legislation, and on this point the Court ruled that it should be given such meaning in any act as comported with its purpose and intent. In certain acts, particularly those providing for lieu selections, only surveyed lands were correctly termed "public lands."<sup>7</sup>

In the contest with the stock interests which had been freely using the public lands for grazing, and who were objecting strenuously to the regulations of the Forest Service which had, in 1905, asserted its right to charge for the use of forest resources, the Court held that any implied license under which public land had been used for private purposes could be recalled by the government at will. The creation of a national forest severed the lands from the public domain, and appropriated them to public use, so that they were no longer subject to use as pasture.<sup>8</sup>

#### Purchase and Exchange

In addition to Presidential proclamation, national forests can, since 1911, be created by purchase.<sup>9</sup> After 1922 provisions by which the owners of claims within the exterior

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7. United States v. Blendauer, 128F. 910, 63 C.C.A. 636.  
8. Northern Pacific Railroad Co. v. Lane 46 App. D.C.434 (1917) Light v. United States (Colo. 1911) 31 S. Ct. 485; 220 U.S. 523; 55 L. Ed. 570. Shannon v. United States (Mont. 1908) 160 F. 870; 88 C.C.A. 52.  
9. U. S. Code, Title 16, Sec. 517, Act. March 1, 1911.

boundaries of national forests may exchange them with the Forest Service for an equal value of public land in the same state, lying within or outside the forests, or may cut and remove an equal value of timber within such national forest in the same state, were made.<sup>10</sup>

### Donation

Provision has also been made for enabling owners of lands valuable chiefly for the growing of timber to donate such lands to the United States in order to assure future timber supplies for agricultural and other industries of the state.<sup>11</sup>

### Jurisdiction over National Forests

When the first forests were reserved, there was some confusion over jurisdiction over them. From 1891-1905, administrative work was carried on by the Department of the Interior, which employed no trained foresters, while the Department of Agriculture, which had no jurisdiction whatever over the forested lands of the public domain, employed a staff of trained men to study and deal with forest problems, but could only help to solve them upon the specific

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10. U.S.Code, Title 16, Sections, 485, 486, 515, 516, 555. Acts of March 20, 1922; June 7, 1924; Feb. 28, 1925; Mar. 3, 1925.  
11. U.S.Code, Title 16, Sec. 569, Act. June 7, 1924.

request of the Department of the Interior. The execution of the laws relating to established forest reservations, as of laws relating to unreserved public lands, was confided to the Secretary of the Interior. The Act of February 1, 1905 transferred to the Secretary of Agriculture the responsibility for executing the laws affecting the lands reserved under the Acts creating Forest Reservations, excepting those laws affecting the surveying, prospecting, locating, appropriating, certifying, or patenting of any such lands.

Limited Jurisdiction of Secretary of Agriculture

The Secretary of Agriculture was vested with jurisdiction to pass upon all applications under any law of the United States providing for the granting of a permission for the temporary occupancy and use of lands in a national forest which, if granted, would in no way affect the fee or cloud the title of the United States, should the reserve be discontinued; but the Department of the Interior retained jurisdiction over all applications affecting lands within a forest reserve, the granting of which would amount to an easement running with the land, with the further understanding that any permission or license granted by the Department of Agriculture is subject to any later disposal of the land by the Department of the Interior. Within the limits of these separate jurisdictions thus defined, the actions

of the two departments proceed harmoniously.<sup>12</sup>

The Act of February 1, 1905 which transferred the forest reservations from the Department of the Interior to the Department of Agriculture likewise empowered the Secretary of Agriculture to make provision for the protection against destruction by fire and depredations upon the public forests, as well as upon the national forests. He was given authority to make such rules and regulations, and to establish such service as would ensure the objects of such reservations; the regulation of their occupancy and use, and their preservation from destruction.<sup>13</sup>

In accordance with this authority, a Bureau of Forestry was set up to promulgate and enforce these regulations. Authority is vested first in the Secretary of Agriculture, then in the persons of a Chief Forester, eight Assistant Foresters, and twenty-three divisional chiefs; in ten Regional Foresters; and under each Regional Forester, in the Forest Supervisors, each of whom customarily has charge of a single forest. This is the administrative pyramid; its apex the Secretary of Agriculture, its base the group of

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12. U.S. Code, Title 16, Sections 472, 475, Act. Feb. 1, 1905. Definition of jurisdiction found in 33 L.D. 609, 610 (1912) 29 Op. Atty. Gen. 303. See also Annual Report, Department of Agriculture, 1906, p. 270-271.

13. U.S. Code, Title 16, Section 551, Acts of June 4, 1897 and Feb. 1, 1905.

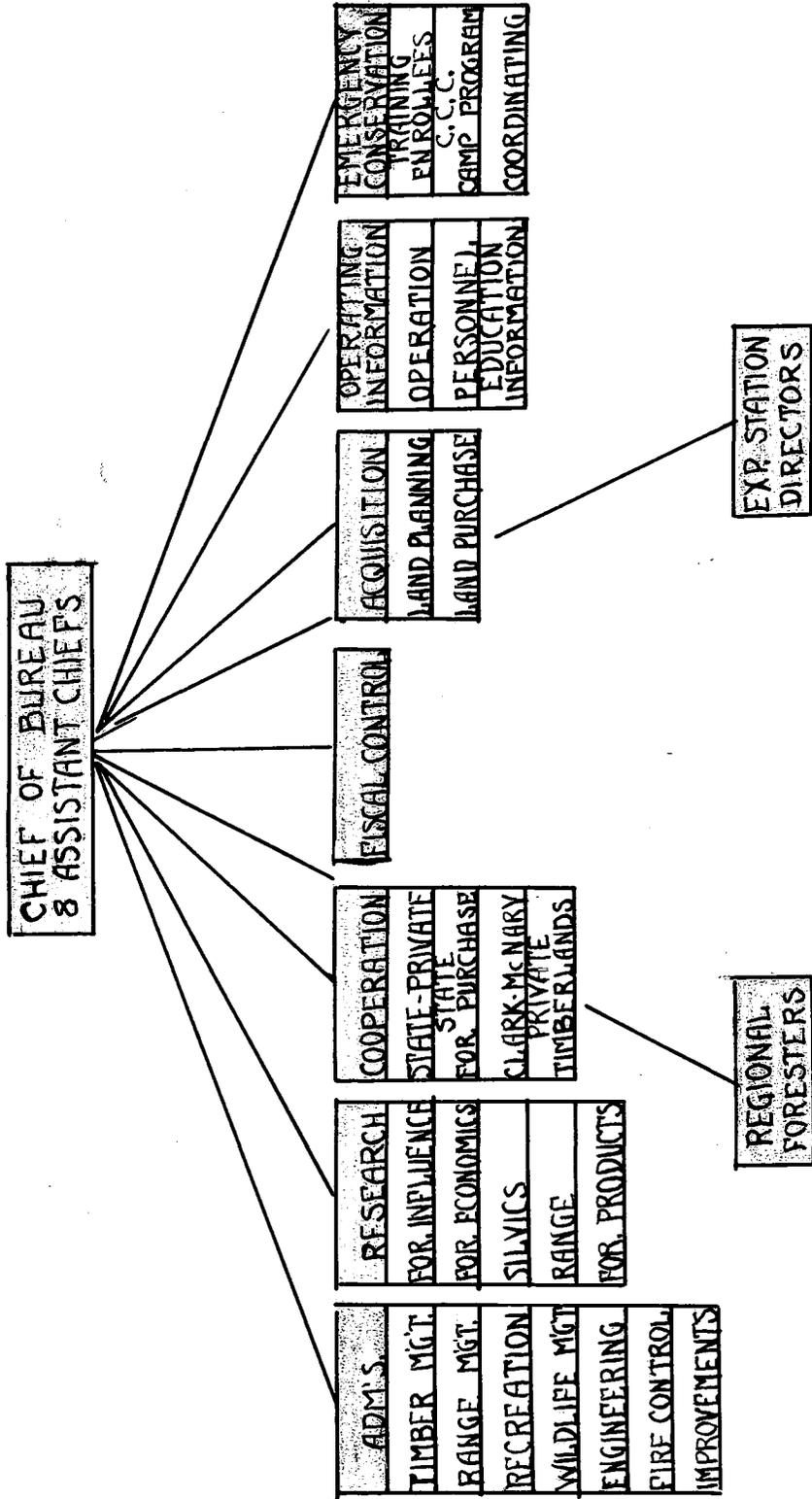


CHART II

ORGANIZATION of BUREAU of FORESTRY, 1936  
FROM ANNUAL REPORT OF FORESTER.

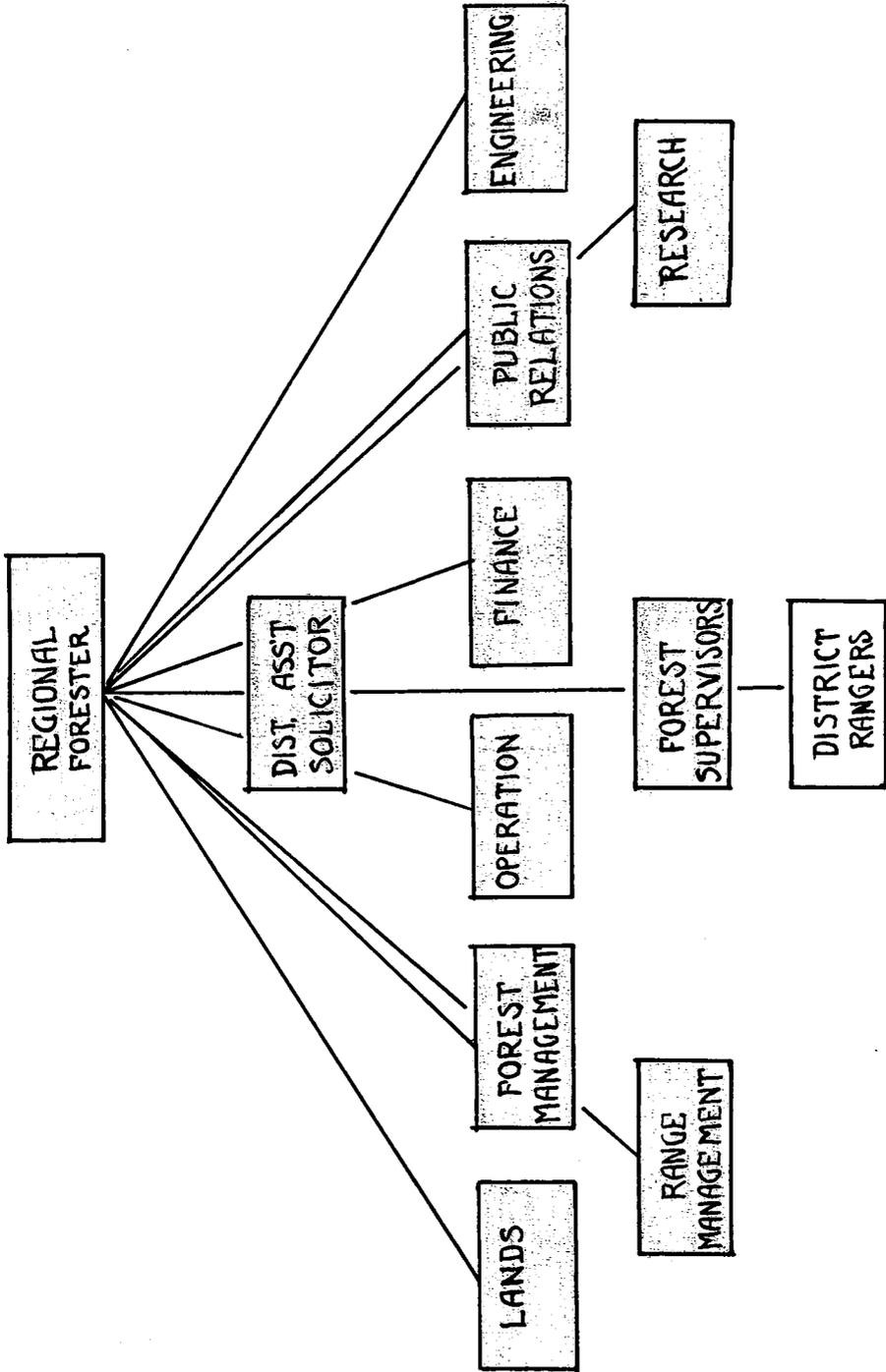


CHART III

ORGANIZATION of REGIONAL ACTIVITIES  
 NATIONAL FOREST MANUAL, SEC. II-A

approximately 150 Forest Supervisors.<sup>14</sup> (See Chart II.)

The division of the work within a region is roughly comparable to the problems encountered--the actual maintenance and administration of the individual forest areas within the region; the control of grazing; the sale and utilization of forest products; the examination of claims filed upon lands within the national forests by individuals interested in agricultural or mineral development; and the scientific study of forest problems, such as re-forestation, control of tree diseases, introduction of improved methods, etc. Each branch is under the direction of men specially trained for the particular work.<sup>15</sup> (See Chart III.)

The validity of the rules and regulations published under the authority of the Bureau and the Secretary of Agriculture was speedily challenged; almost at once the rights of stockmen to the free and unrestricted use of grass lands were affected. The force of such departmental regulations was upheld in a suit brought by the United States for violation of grazing restrictions. The Arizona Courts, in 1904, ruled that Congress had the right to place the control of the occupancy and use of forest reservations in the hands of the Department of Interior (now Agriculture)

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14. U.S. Department of Agriculture, Report of the Forester, 1936.

15. U.S. Forest Service Manual, 1929. Section 11-A.

for their use and preservation, and that a criminal prosecution could be brought to punish a person who grazed animals in a Forest Reserve in violation of the regulations published by the Department.<sup>16</sup>

Several years after this decision was handed down, the courts held, in another case, that legislative power was not unconstitutionally delegated by provisions making criminal the violation of the rules and regulations covering the national forests.<sup>17</sup> The Secretary of Agriculture, therefore, has authority under the Act of 1905 to make regulations having the full effect and force of law to govern the grazing of stock or cutting of timber on national forests.<sup>18</sup>

#### Relation to State Authorities

The powers of arrest granted to forest officers required careful definition, if conflicts with State authorities were to be avoided. In 1897 and in 1911 this relationship was set forth in law. The Act of 1897 was applicable to forests reserved under the right of Executive proclamation, and the

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16. Dent v. United States, 8 Ariz. 413 (1904) 76 P. 455, over-ruling 8 Ariz. 138 (1903) 71 P. 920.

17. United States v. Grimaud (Cal. 1911) 31 S. C. 480; 220 U.S. 506.

18. Light v. United States (Colo. 1911) 31 S.Ct. 485; 220 U.S. 523; United States v. Grimaud, op. cit., Mc Fall v. Arkoosh (1923) 215 P. 978, 37 Idaho 243. The United States is entitled to injunctive relief to restrain a cattle-owner from grazing his cattle on a national forest without the requisite permit. The use of the preposition "on" rather than "in" in describing such use is technically correct.

Act of 1911 to forest lands acquired on the recommendation of the National Forest Reserve Commission.<sup>19</sup> Under these laws all persons employed in the Forest Service have the authority to make arrests for the violations of the laws and regulations relating to the national forests.<sup>20</sup> In addition to the authority to enforce the departmental regulations for protection of the forests, the officers of the Service within any State are required to aid in the enforcement of the laws of the State or Territory, with regard to stock, for the prevention and extinguishing of forest fires, and for the protection of fish and game.<sup>21</sup>

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19. U. S. Code, Title 16, Sec. 480 and Sec. 559, Acts of June 4, 1897; Mar. 1, 1911, and Mar. 3, 1905 respectively. "The jurisdiction, both civil and criminal, over persons within national forests shall not be affected or changed by reason of their existence, except so far as the punishment of offenses against the United States therein is concerned; the intent and meaning of this provision being that the State wherein any such national forest is situated shall not, by reason of the establishment thereof, lose its jurisdiction, nor the inhabitants thereof their rights and privileges as citizens, or be absolved from their duties as citizens of the state."

20. Any person so arrested shall be taken before the nearest United States Commissioner, within whose jurisdiction the forest is located, for trial. Upon sworn information by any competent person, the Commissioner shall issue process for the arrest of any person so charged, but nothing contained in the law can be construed as preventing the arrest by any officer of the U. S. Forest Service, without process, of any person taken in the act of violating said laws and regulations.

21. U. S. Code, Title 16, Sec. 553, Act. May 23, 1908. These provisions for cooperation with State authorities accompanied an appropriation to protect the national forests in the Agricultural Appropriation Act for the fiscal year 1909.

In 1928 cooperation with the States and Territories, and with private agencies interested in conservation was provided for.<sup>22</sup> The Secretary of Agriculture was authorized and directed to conduct such investigations, experiments, and tests as he deemed necessary to determine the best methods of reforestation, and of growing, managing, and utilizing timber, forage, and other forest products; of maintaining favorable conditions of water-flow; or preventing erosion; of protecting timber and other forest growth from fire, insects, disease, or other harmful agencies; and of obtaining the fullest and most effective use of forest lands. Such research in Arizona and New Mexico is conducted by the Southwestern Forest and Range Experiment Station, the outgrowth of the work carried on by the old Fort Valley Experiment Station, established at Flagstaff in 1908.

#### Occupancy and Use of National Forests

##### Settlers and Prospectors

Privileges conferred upon the inhabitants of a State or territory by local laws were not to be abridged by the newer jurisdiction of the United States Forest Service.<sup>23</sup>

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22. U. S. Code, Title 16, Sec. 581, a-1, Act. May 22, 1928.

23. U. S. Code, Title 16, Sections 480 and 559, Acts of June 4, 1897 and March 1, 1911.

This restriction made necessary a body of law and regulation to define the rights of the people, and the prerogatives of the Forest officers in the occupation and use of forest lands and resources.

The matter of ingress and egress for actual settlers and for prospectors had been provided for in the act of June 4, 1897, which stipulated that no laws previously passed should be construed as prohibiting the entrance or exit of actual settlers residing within the boundaries of national forests, or the crossing of them to and from their property. The necessary roads and improvements necessary for such ingress and egress could be constructed within the forests, and the settlers were free to utilize their property, under rules and regulations prescribed by the Secretary of Agriculture. Nothing in these departmental regulations was to prohibit any person from entering the forests for a lawful purpose, specifically including the right of entry for prospecting, locating, and developing the mineral resources. Persons so engaged, however, were required to comply with the rules of the Forest Service.<sup>24</sup>

The pressure throughout the west for the right to enter the agricultural lands in the reserves under the Homestead

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24. U. S. Code, Title 16, Sec. 478, Act June 4, 1897, and National Forest Manual, Regulations L-1 and L-6.

Laws was very great.<sup>25</sup> As early as 1906, and again in 1908, 1912, and 1925, the interests making this demand succeeded in securing the passage of laws by Congress intended to give such relief. In 1906, for example, the Secretary of Agriculture was authorized, in his discretion, "to examine and ascertain the location and extent of lands within permanent or temporary national forests which are chiefly valuable for agriculture and which, in his opinion, may be occupied for agricultural purposes without injury to the forests, and which are not needed for public purposes, and to list and describe the same," and file the lists and descriptions with the Department of the Interior, with the request that the lands be opened to entry in accordance with the provisions of the Homestead laws.<sup>26</sup> Priority right to entry under this provision was granted to settlers who were actually occupying the lands, and developing them for agricultural purposes, prior to January 1, 1906, and to those qualified individuals who had applied for the examination and listing of their lands.

The Act of 1906 left much discretion in the hands of the Secretary of Agriculture, and for that reason was not entirely satisfactory to the interests responsible for the

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25. Southwestern Stockman, Farmer and Feeder, Apr. 27, 1906, Unsigned article on page 2.

26. U. S. Code, Title 16, Sec. 506, Acts of June 11, 1906; May 23, 1908; August 10, 1912; March 3, 1925.

insistent demand. Accordingly, a supplementary law was passed in 1913 which directed and required the Secretary to select, classify, and segregate all lands within the boundaries of national forests that might be opened to entry and settlement under the Homestead laws applicable to the national forests.<sup>27</sup>

Pressure for the restoration of mineral lands to the public domain was quite as heavy as that for reopening the agricultural lands. The demand of these interests was met in the Act of June 4, 1897, by a provision that any public lands within the limits of the forest which, after personal inspection by a competent person appointed by the Secretary of the Interior, should be found better adapted for mining or agricultural purposes than for forest usage, might be restored to the public domain. Any mineral lands which had been, or which might be shown to be such, and therefore subject to entry under the existing mining laws, were to continue to be subject to such location and entry, notwithstanding any provisions contained in regulations of the Forest Service.<sup>28</sup>

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27. U. S. Code, Title 16, Sec. 512, Acts of March 4, 1913 and March 3, 1925.

28. U. S. Code, Title 16, Sections 478 and 482, Act June 4, 1897. It is interesting to note that the wording of this section of the Act would seem to indicate that agricultural lands might be subject to such entry, although in fact it was not till the passage of the Act of June 11, 1906 that they actually were.

The exercise of this right to make mineral entry led to some controversy, since it was sometimes detrimental to the forests. The conflicting jurisdiction between the Department of Interior and Department of Agriculture resulted in a court decision, rendered in a suit brought by the Forest Service for improper use of lands held under such a claim. The United States District Court for Idaho held in 1910 that the location of mining claims within a national forest does not withdraw the land embraced therein from the jurisdiction of the Forest Service, and while the Service does not withhold from the miner the right to take and utilize the entire claim, including the surface, for all purposes, and to the same extent, to which he could have possessed and used it if no national forest existed, it confers no right to use the surface of such a claim for anything other than mining purposes.<sup>29</sup> The jurisdiction of the Forest Service over such claims does not apply unless there is evidence of misuse and bad faith. It, however, is the privilege of the Service to challenge the filing of such mineral claims, if there is insufficient evidence of the presence of minerals upon the land. In this matter the Court has upheld the conservative principles of the Forest Service, and nothing short of a probable commercially

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29. United States v. Rizzinelli, (D.C. Idaho, 1910) 182 F.675 and National Forest Manual, Regulations L-3, L-6, and T-8.

valuable mine will suffice as a basis for entry of a mineral claim in a forest. Discovery alone is not considered sufficient.<sup>30</sup>

The regulations for the use of the lands of the national forests, as for the public domain, include provision for the erection of Game Refuges by the proclamation of the Executive, and by special act of Congress. Such areas are set aside for the protection of game animals, birds, and fish. The first game reserve in the United States was made on the Grand Canyon National Forest in 1906.<sup>31</sup>

In 1913 a plan of cooperation in game protection was entered into by the United States Forest Service and the State Game Warden of Arizona. By this agreement, forest officers connected with the national forests were commissioned deputy game wardens. Under the obligations assumed they were to pay strict attention to the enforcement of the game laws, insofar as their duties as forest officers would permit. This agreement also provided for cooperation in fire protection; in case the regular deputy state game warden discovered a fire on an area within or contiguous to a national forest, it was expected that he would

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30. United States v. Lavenson (D.C. Wash. 1913) 206 F. 755.  
31. U. S. Code, Title 16, Sec. 683, Act. Aug. 11, 1916.

promptly notify the nearest forest officer of the fact.<sup>32</sup>

### Timber Resources

Reference has been made in a previous chapter to the lumber interests which were particularly eager to secure some modification of the public land and forest laws in order to make it possible for them lawfully to acquire commercial saw-timber in the national forests. The public land and conservation laws did not make any provision for supplying this legitimate demand until 1897. The result was a great deal of fraudulent entry under the various homestead laws. Later laws amplified the privilege granted in the Act of June 4, 1897. Timber which was mature, or which might safely be removed without injury to the growth of trees in the forests was to be marked and designated, advertised for sale, and sold by the Forest Service to the highest bidder. After sale, the timber was to be cut and removed under the direct supervision of some disinterested party appointed by the Secretary of Agriculture.<sup>33</sup> Inasmuch as practically all the forests of Arizona are on Federal reservations, the supply of timber for the commercial lumbering interests (fifth in order of importance among the

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32. Editorial, Southwestern Stockman, Farmer and Feeder, Sept. 5, 1913, p. 14.

33. U.S. Code, Title 16, Sec. 476, Acts of June 4, 1897; June 6, 1900; Feb. 1, 1905; June 30, 1906; and Mar. 3, 1925.

state's industries) has been almost entirely dependent upon this privilege.

The demands of settlers to use timber and stone from the national forests, without cost to them, was pressed long before any conservation policy was adopted by the government and has been mentioned in the discussion of the Acts of 1878 in a previous chapter. Although originally a privilege granted under the public land laws, the Forest Service was, in 1897, specifically directed to continue to permit settlers to use timber and stone from the national forests free of charge, when it was intended for domestic purposes, or for the development of mines. The only restriction made is that free timber is not to be taken outside the state or territory in which it is cut, nor used in any sort of commercial operation.

In 1912, homesteaders and farmers were also given the privilege of purchasing at cost of marking and supervising the cut, mature, dead, and down timber for domestic use. This provision was not intended to restrict the free use of timber, but rather to make available larger amounts of timber than could be granted under the Act of 1897.<sup>34</sup>

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34. U. S. Code, Title 16, Sec. 489, Act Aug. 10, 1912, and Sec. 477, Act of June 4, 1897.

### Rights of Way

In the late nineties, the question of rights of way for irrigation works became important in the Southwest. In 1898 the Secretary of the Interior (since 1905, Agriculture) was instructed to grant the right of way through national forests for ditches, canals, or reservoirs, approved by the Reclamation Service, and intended for public purposes, and to permit the subsidiary development of power sites within the national forests for purposes of irrigation or drainage.<sup>35</sup> Again, in 1905, the Secretary of Agriculture was instructed to grant the right of way for ditches, flumes, pipes, tunnels, and canals, and for dams, reservoirs, or water plants for municipal, mining, or ore-milling purposes, to citizens and corporations of the United States. The Department was permitted to regulate such construction, subject to the laws of the State or Territory concerned, covering the erection of such works.<sup>36</sup> This provision was contained in the act which transferred the execution of laws relating to the national forests from the Secretary of the Interior to the Secretary of Agriculture. The Department of Agriculture, however, has never had jurisdiction over its execution. It has been administered by the

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35. U. S. Code, Title 43, Sec. 951, Acts of May 11, 1898 and March 4, 1917.

36. U. S. Code, Title 16, Sec. 525, Act February 1, 1905.

Department of the Interior, doubtless upon the interpretation that the right of way granted by its provisions is a qualified fee, and therefore constitutes an appropriation of the land, which, accordingly, falls within the exceptions made in defining the powers of the respective departments.<sup>37</sup>

For the same reason, while the Secretary of Agriculture is directed to grant rights of way for wagon roads or railroads through the national forests, the Secretary of the Interior actually does so, when they are not injurious to the public interests in the forests. The power to grant such rights of way was reserved by the Secretary of the Interior when the transfer of jurisdiction over the forests was made in 1905.<sup>38</sup>

#### Use of Waters

The right to the use of waters is given by inference with granting of the right of way for the building of irrigation works, and specifically for domestic, mining, milling of ores, and irrigation purposes. All waters within the boundaries of national forests are subject to such use, under the laws of the State and the Federal

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37. U. S. Code, Historical note on Title 16, Sec. 524.

38. U. S. Code, Title 16, Sec. 525, Act. Mar. 3, 1899 and National Forest Manual Regulation L-7.

governments, as well as the regulations established by the Department of Agriculture.<sup>39</sup>

The purpose and effect of the regulation of water rights was to facilitate the development of dry lands for farming, and should be viewed as a part of the first objective of the public land policy of the United States, i.e. promoting settlement. This broad grant of privileges for such development has been particularly important to the people of Arizona where agriculture is the second most important industry.

#### Fiscal Regulation

##### Expenditures by Secretary of Agriculture

The fiscal regulation of national forests has been of considerable interest to those states and territories in which a large percentage of the most valuable land has been reserved by the government. The Territory of Arizona had an especially large proportion of its area included in Federal reservations, and the income from privately owned lands was small in comparison with the revenue which might potentially have been available if the rich timber lands

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39. U. S. Code, Title 16, Sec. 481, Act. June 4, 1897, and Title 43, Sec. 946, Acts of Mar. 3, 1891; March 4, 1917.

TABLE 2

ROAD AND TRAIL CONSTRUCTION WITHIN NATIONAL FOREST  
BOUNDARIES OF ARIZONA

| F.Y.  | Construction |        | Total Maintained |        | Total Construction to date of report |        |
|-------|--------------|--------|------------------|--------|--------------------------------------|--------|
|       | Roads        | Trails | Roads            | Trails | Roads                                | Trails |
| 1921* | 85.2         |        | 209.0            | 481.1  | 295.3                                | 481.1  |
| 1922  |              |        |                  |        |                                      |        |
| 1923  | 136.7        | 313.8  | 465.6            | 993.8  | 578.1                                | 506.8  |
| 1924  | 88.5         | 244.0  | 539.3            | 1237.8 | 847.9                                | 852.7  |
| 1925  |              |        |                  |        |                                      |        |
| 1926  | 228.9        | 143.2  | 730.2            | 781.0  | 746.6                                | 1435.2 |
| 1927  | 134.5        | 56.3   | 815.4            | 646.8  | 822.6                                | 1397.3 |
| 1928  | 101.6        | 10.5   | 1184.9           | 475.0  | 982.7                                | 1502.0 |
| 1929  | 358.7        | 81.0   | 1085.0           | 897.5  | 1341.4                               | 1583.0 |
| 1930  | 180.9        | 58.0   | 1220.5           | 1069.5 | 1522.3                               | 1641.0 |
| 1931  | 163.2        | 59.6   | 798.5            | 976.0  | 1970.2                               | 1736.6 |
| 1932  | 327.6        | 110.3  | 1952.7           | 2860.0 | 1808.6                               | 1748.5 |
| 1933  | 493.1        | 185.0  | 3586.0           | 2554.5 | 2463.3                               | 1924.6 |
| 1934  | 520.8        | 144.5  | 3983.1           | 2699.0 | 2984.1                               | 2069.1 |
| 1935  | 277.2        | 59.0   | 4239.8           | 2548.0 | 3261.3                               | 2128.1 |
| 1936  | 255.9        | 39.8   | 4395.5           | 2708.0 | 3517.2                               | 2288.6 |

\*Accurate information on road construction and maintenance prior to 1921 cannot be secured. Accurate records are reported to be lacking by the office of the Regional Forester at Albuquerque. Other data are secured from Reports of the Forester for the Fiscal Years.

had been subject to individual development and taxation. The burden of maintaining an adequate system of roads and trails, connecting the scattered and sparsely settled communities, was heavy. What was true in Arizona was likewise true of other western states and territories. In order to satisfy the recurrent complaints on this situation, the Federal Government directed the Secretary of Agriculture to expend 10% of each year's receipts from the national forests for the construction and maintenance of roads and trails within the national forests in states from which such proceeds were derived, and to cooperate with the states in the construction and maintenance of any system of highways of which such roads were a part. By the end of the fiscal year 1936, the Forest Service had built a total of 3,517 miles of roads, and 2,288 miles of trails within Arizona's national forests, and was maintaining 4,395 miles of roads, and 2,708 miles of trails.<sup>40</sup>

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40. U.S.Code, Title 16, Sec. 501, Act Mar. 4, 1913. By the provisions of an act of Nov. 9, 1921 (U.S.Code, Title 23, Sec. 23) additional provision for forest road and trail construction was made. The Secretary of Agriculture was authorized to expend 50% (but not to exceed \$3,000,000 for any one fiscal year) of the appropriation made, for the survey, construction, and maintenance of forest roads and trails which were of primary importance for the protection, administration and utilization of the national forests, or necessary for the use and development of the resources upon which communities within or near the forests were dependent. The apportionment was to take into consideration the existing transportation facilities, value of resources served, relative fire danger, and comparative difficulties of road and trail construction. The balance of the appropriation was to be expended upon construction of forest roads and trails of primary importance to the states.

With the intention of remedying injustices which often resulted to the public in the performance of duties by forest officers, provision has been made for reimbursing owners of horses and equipment lost, damaged, or destroyed while being used for fire-fighting, or other official business,<sup>41</sup> and for damages caused to private property in the protection, administration and improvement of the national forests.<sup>42</sup>

When excess funds are received by the Forest Service on contracts for the sale of timber or other products upon which deposits in advance are required, or from the sale of various types of permits, or when money is erroneously collected for trespass which is later found not to have been committed, the Secretary of Agriculture is authorized to make refunds to such individuals.<sup>43</sup>

Money received as contributions toward cooperative work in forest investigations, or for the protection and improvement of the national forests,<sup>44</sup> constitutes a special fund for the payment of expenses of such investigations, protection, or improvements, and for refunds to the contributors of amounts paid in by them in excess of their share

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41. U. S. Code, Title 16, Sec. 502, Act March 3, 1913.

42. U. S. Code, Title 16, Sec. 574, Act May 27, 1930.

43. U. S. Code, Title 16, Sec. 499, Acts of March 1, 1907; March 4, 1911; March 4, 1917; and June 7, 1924.

44. U. S. Code, Title 16, Sec. 581, a-1.

of the costs.<sup>45</sup>

### Receipts to State

Provisions have been made for paying to the states a stipulated percentage of the gross income of the national forests located within their boundaries. The Act of May 23, 1908 provides that 25% of all moneys received during any fiscal year from each national forest shall be paid to the state in which such national forest is situated, to be expended as the State Legislature may prescribe, for the benefit of the public schools and public roads of the county, or counties in which such national forest is situated. No state, however, shall receive for any county an amount equal to more than 40% of the total income of that county from all other sources.<sup>46</sup>

The provisions of this act superseded previous laws for the payment, for the same purposes, of 10% of the money received from each forest.<sup>47</sup>

Arizona benefits further under the Enabling Act of June 20, 1910, which contained an exceptional provision for the states of New Mexico and Arizona.

It was customary for the Federal Government to grant

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45. U. S. Code, Title 16, Sec. 498, Act June 30, 1914.

46. U. S. Code, Title 16, Sec. 500, Acts May 23, 1908; March 1, 1911; June 30, 1914.

47. Acts of June 30, 1906 and March 4, 1907.

TABLE 3

PAYMENTS TO STATE OF ARIZONA FROM RECEIPTS  
OF HER NATIONAL FORESTS

| Fiscal Year | Act of 6-30-06 | Act of 3-4-07 | Act of 5-23-08 | Act of 6-30-10 | Net F.Yr. Receipts from which computation was made |
|-------------|----------------|---------------|----------------|----------------|--|
| 1906        | \$7,940.50     |               |                |                | \$ 79,404.93                                       |
| 1907        |                | \$17,307.92   |                |                | 173,079.27   |
| 1908        |                |               | \$ 42,631.27   |                | 170,525.08   |
| 1909        |                |               | 38,313.45      |                | 153,253.79   |
| 1910        |                |               | 51,082.55      | 587.34         | 204,917.55   |
| 1911        |                |               | 49,957.05      | 21,714.25      | 221,542.43   |
| 1912        |                |               | 61,651.02      | 27,737.71      | 274,341.79   |
| 1913        |                |               | 74,659.49      | 36,226.65      | 334,864.63   |
| 1914        |                |               | 63,398.34      | 30,730.58      | 284,323.94   |
| 1915        |                |               | 59,807.89      | 28,966.46      | 268,198.04   |
| 1916        |                |               | 62,746.86      | 32,324.14      | 287,145.02   |
| 1917        |                |               | 81,036.72      | 42,884.80      | 367,031.68   |
| 1918        |                |               | 91,386.49      | 48,286.09      | 413,832.05   |
| 1919        |                |               | 113,152.97     | 58,775.83      | 511,387.71   |
| 1920        |                |               | 124,628.19     | 64,774.01      | 563,286.77   |
| 1921        |                |               | 42,430.51      | 23,869.88      | 193,591.92   |
| 1922        |                |               | 127,749.92     | 66,704.64      | 577,704.32   |
| 1923        |                |               | 105,827.98     | 48,749.81      | 472,061.63   |
| 1924        |                |               | 94,214.40      | 43,114.32      | 419,971.92   |
| 1925        |                |               | 59,670.64      | 27,022.17      | 265,704.73   |
| 1926        |                |               | 29,176.49      | 13,082.69      | 129,788.65   |
| 1927        |                |               | 57,353.72      | 25,377.30      | 254,792.18   |
| 1928        |                |               | 79,409.96      | 35,058.19      | 352,698.03   |
| 1929        |                |               | 92,648.56      | 40,400.81      | 410,995.05   |
| 1930        |                |               | 92,082.37      | 40,607.43      | 408,936.91   |
| 1931        |                |               | 68,919.57      | 30,358.89      | 306,037.17   |
| 1932        |                |               | 47,665.76      | 20,879.22      | 211,542.26   |
| 1933        |                |               | 66,674.98      | 28,093.85      | 294,793.77   |
| 1934        |                |               | 55,000.60      | 22,879.47      | 242,881.87   |
| 1935        |                |               | 50,263.45      | 20,407.68      | 221,383.23   |
| 1936        |                |               | 79,339.11      | 31,329.43      | 348,685.87   |
|             | \$7,940.50     | \$17,307.92   | \$2,062,880.31 | \$910,943.64   | \$9,418,704.19                                     |

Data secured from Regional Fiscal Agent Albert Morris,  
March 12, 1937.

sections 2, 16, 32, and 36 in each township to a state for the use of schools. In the case of these two territories, Federal reservation of vast tracts of land had preceded the formation of state government. These sections were not, in all cases, available for grants in fee. In order not to work an injustice upon them by withholding part of the school sections, the Act provided that since "the grants of sections 2, 16, 32, and 36 to said States, within national forests now existing or proclaimed shall not vest title to said sections in said state until the part of said national forests embracing any of said sections is restored to the public domain ... the said granted sections shall be administered as a part of said forests, and at the close of each fiscal year there shall be paid by the Secretary of the Treasury to the State, as income for its common school fund, such proportion of the gross proceeds of all the national forests within the State as the area of lands hereby granted to said State for school purposes, which are situated within said forests, ... and for which no indemnity has been selected, may bear to the total area of the said sections, when unsurveyed, to be determined by the Secretary of the Interior, ... the amount necessary for such payments being appropriated and made available annually ...."<sup>48</sup> Under

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<sup>48</sup>U. S. Statutes at Large, Vol. XXXVI, p. 573, Act of June 10, 1910, Section 24.

this provision the school fund of the State of Arizona since 1912 has been paid 25% of the gross proceeds of the national forests.

CHAPTER V  
STATE LEGISLATION AND REGULATION OF  
FORESTS

It has been pointed out that the State of Arizona has, in fact, slight jurisdiction over her forest resources, which were almost entirely reserved by the Federal Government prior to the granting of statehood, and have since then been maintained almost intact, so far as area is concerned. The insignificant amount of state-owned forest land (0.7%) and those sections granted for common schools (sections 2, 32, 16, and 36 in each township) title to which never passed to the state,<sup>1</sup> have been handled by the United States Forest Service under provisions of the Enabling Act of June 20, 1910, and a special cooperative agreement made January 15, 1914, between the State Land Commission and the Department of Agriculture.<sup>2</sup> This agreement, which has survived changes in governors and personnel of the State Land Commission, covered the practice of forestry on certain State lands (those designated for University purposes) and contained features which were unusual at that time, and are

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1. U. S. Statutes at Large, Vol. XXXVI, p. 573.

2. A copy of this agreement will be found in Appendix A. Its chief features are also discussed by John D. Guthrie, in "Forestry on Arizona State Lands," Journal of Forestry, Vol. 23, p. 378-385.

unusual even now. After citing the legal description of the lands affected and quoting the act under which the State Land Commission was authorized to handle these lands, a list of the specific agreements made by each party to the contract is given. The principal object of the agreement was to arrange for the disposition of merchantable timber lying on State lands within the exterior boundaries of the Coconino and Tusayan National Forests, in accordance with the methods and practice of the Forest Service. The Secretary of Agriculture, through the Forest Service and the District Forester, agreed to furnish the Land Commission with the rules and regulations for the administration and use of the national forest lands, and copies of the fire plans for the adjacent national forests. He agreed to advise the Commission of Forest Service timber contracts, and to instruct them in the proper care and protection of the State's lands. He promised that, upon request, the Forest Service officers would examine and report on the desirability of timber sales for the University lands, would prepare logging plans, and set stumpage values. This service was to be free of cost to the State, inasmuch as the protection, conservative lumbering and forest management of the State lands was necessary for the proper protection of the national forests adjacent to them. The Forest Service further agreed to designate, upon request by the State, forest officers to work at scaling, supervision of

logging, and other operations connected with the removal of the timber from State lands. The salaries and expenses of the officers were to be paid by the State.

The State Land Commission on its part agreed to employ at least one fire guard to work with local forest officers during the fire season, and to pay all expenses for suppression of forest fires on, or originating on, these State lands.

Further, the commissioners agreed to cut and remove timber in accordance with national forest rules and regulations and with the advice given by the Forest Service. They promised to consult with the Forest Service before making any sales of timber, although the negotiations were to be conducted entirely by the State officials.

The provisions for fire protection in this agreement are those commonly made by the Service in cooperation with private owners. Most of the other provisions, however, are unique.

The agreement for cooperation in game protection has been mentioned previously, and became effective August 15, 1913.

The first Public Land Code of Arizona contained many wise provisions for forest management.<sup>3</sup> It was based on

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3. State of Arizona, Public Land Code, Laws of Second Special Session, Second State Legislature, 1915. See Appendix B.

the report of the Land Commission, composed of Mulford Winsor, C. Y. Byrne and Wm. A. Moody, the three men who had made the cooperative agreement of the previous year.

Section 48 of the Code provided for the reservation of lands valuable chiefly for timber from sale until the timber had first been sold separately, and lands chiefly valuable for the production of saw timber were to be entirely exempt from the provisions of the general act relating to the sale of State lands.<sup>4</sup>

Section 76 provided that the rules and regulations made by the State for the care, sale, and administration of timber and timber products should conform to those of the United States Forest Service,<sup>5</sup> and Section 77 provided that contracts for the sale of timber should not exceed five years in term, nor 50 million feet to any one individual purchaser at one sale.<sup>6</sup>

Section 78 provided that a separate timber account fund should be established for handling the revenue from the University lands, while Section 81 defined trespass on State lands and stipulated the penalties attached

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4. Public Land Code, op. cit., Sec. 48, p. 21. Compare with Section 2980 of the Revised Land Code of Arizona, compiled in 1936, p. 39, Section on Sale of State Lands.

5. Ibid., Sec. 76. Compare with Section 3003 of the Revised Land Code, p. 49.

6. Ibid., Sec. 77. Compare with Section 3004 of the Revised Land Code, p. 49.

thereto.<sup>7</sup>

These provisions of the Land Code of 1915 stand virtually unchanged at this date. At no time has Arizona had a State Forestry Department, nor engaged in any specific forest activities, doubtless because there is no incentive nor demand for such action.<sup>8</sup>

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7. Ibid., Sec. 78. Compare with Section 3004 of the Revised Land Code. Sec. 81. Compare with Section 3006 of the Revised Land Code, p. 50.

8. Report of the Committee on the Conservation and Administration of the Public Domain, Act of April 10, 1930 (1931) p. 38.

## CHAPTER VI

### TIMBER RESOURCES AND OBJECTIVES FOR MANAGEMENT

#### Timber Resources

On most of the national forests in Arizona there is a considerable amount of saw timber, ninety percent of which is Ponderosa, or western yellow pine, six percent Douglas fir, two percent white fir, one percent Englemann Spruce, and one percent minor varieties.<sup>1</sup>

It is estimated that there were twenty billion, five hundred million board feet of saw timber in the forests of the state in 1935, and thirty million cords of wood on the woodland timberlands below the saw timber belt. These estimates do not include mesquite, cottonwood, ironwood, or other woods found on the lowlands.

#### Forest Types

The Ponderosa, or western yellow pine, which is the dominant timber type in Arizona's forests, is sometimes

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1. Cooperrider, C.K., "Arizona and Its Heritage: The Forests," University of Arizona General Bulletin, Vol. 7, No. 3, (1936) p. 58; and U. S. Forest Service Bulletin No. 61, Definition of Terms: Board-Foot: contents of a board 1 foot square, and 1 inch thick. Timberland: that class of forest which contains in commercial quantities trees of sufficient size to furnish saw logs, pulp wood, ties, poles, etc. Woodland: that forest which contains trees fit for firewood or fencing, but none, or very few trees which are suitable for the uses enumerated above.

called bull-pine, sometimes scrub pine, and infrequently white pine. There are two forms of the tree in Arizona, black-jack and yellow pine. The difference is one of age and not of kind. Black-jack is merely the form which yellow pine assumes before it reaches the age of 125-150 years during which period its bark is dark red-brown or blackish, in strong contrast to the lighter, widely furrowed bark of mature trees.<sup>2</sup>

No average rate of growth can be given for the trees of the Southwest, but it takes the common lumber species from 150 to 200 years to reach a diameter of 20-23 inches.<sup>3</sup> Arizona forests in which records of growth have been maintained for twenty-five years show an average yearly increment of 60 to 100 board feet per acre.<sup>4</sup>

One great Ponderosa pine forest extends along the Mogollon Plateau in an almost unbroken belt twenty to sixty miles wide, north of Williams to the Grand Canyon and three hundred miles in a southeasterly direction through Central Arizona into New Mexico almost to the Rio Grande. Much of this pine belt is uncut virgin timber, although the

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2. Woolsey, Theodore S., Jr., "Western Yellow Pine in Arizona and New Mexico," U. S. Forest Service Bulletin No. 101. (1911)

3. Forest Service, Handbook of Information for Social and Civic Organizations in the Southwest (1923).

4. Pearson, G. A., "Lumber Industry," University of Arizona Bulletin, op. cit., p. 180.

TABLE 4

AREA OF ARIZONA'S NATIONAL FORESTS BY COUNTIES, 1935

| Forest          | Counties   | Net Area<br>Acres | Forest<br>Total Acres |
|-----------------|------------|-------------------|-----------------------|
| Apache          | Apache     | 442,620           | 679,431               |
|                 | Greenlee   | <u>236,811</u>    |                       |
| Coconino        | Coconino   | 1,298,992         | 1,726,541             |
|                 | Yavapai    | <u>427,549</u>    |                       |
| Coronado        | Cochise    | 488,445           | 1,323,799             |
|                 | Pima       | 385,367           |                       |
|                 | Pinal      | 24,723            |                       |
|                 | Santa Cruz | <u>425,264</u>    |                       |
| Crook           | Cochise    | 22,400            | 1,422,804             |
|                 | Gila       | 340,456           |                       |
|                 | Graham     | 397,264           |                       |
|                 | Greenlee   | 512,118           |                       |
|                 | Maricopa   | 10,866            |                       |
|                 | Pinal      | <u>139,700</u>    |                       |
| Kaibab          | Coconino   | 1,727,035         | 1,771,327             |
|                 | Mohave     | 28,059            |                       |
|                 | Yavapai    | <u>16,233</u>     |                       |
| Prescott        | Coconino   | 43,332            | 1,253,831             |
|                 | Yavapai    | <u>1,210,499</u>  |                       |
| Sitgreaves      | Apache     | 43,411            | 800,510               |
|                 | Coconino   | 287,325           |                       |
|                 | Navajo     | <u>469,774</u>    |                       |
| Tonto           | Gila       | 1,336,199         | 2,411,221             |
|                 | Maricopa   | 681,043           |                       |
|                 | Pinal      | 59,028            |                       |
|                 | Yavapai    | <u>334,951</u>    |                       |
| Total for State |            |                   | <u>11,389,464</u>     |

Statistics from Office of Southwestern Region, 1935.

large mills located at Williams, Flagstaff, Mc Nary, and Standard have been obtaining their timber from it for some years.<sup>5</sup>

### Resources in Timber of Individual National Forests

Turning now to the individual forests and their general resources, we find first the Apache, covering a net area of 679,431 acres in Apache and Greenlee Counties, in the White Mountains, stretching along the New Mexico line from Springerville to Clifton, and administered from headquarters in Springerville, a small town on the transcontinental highway, about one hundred miles south-east of the Santa Fe Railroad at Holbrook, Arizona. For the most part the Apache National Forest lies in high mountain country, with mountain meadows, rugged peaks and deep canyons over which the Apache Indians once roamed, from whom it takes its name.<sup>6</sup>

The timber resources of the Apache National Forest are seventy-five percent yellow pine, and about twenty-five

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5. Cooperrider, C.K., op. cit., p. 56. This author challenges the accuracy of statements frequently made that this is the "largest known forest area composed of one species of tree," and that, therefore, Arizona has "the largest pine forest in the world." Compare with U.S.D.A. Circular No. 318, "The National Forests of Arizona," p. 1, and Hall, Sharlot M., "The Forests of Arizona," Out West Magazine, Vol. 25 (1906) p. 476.

6. U.S.D.A. Circular No. 318, op. cit., p. 5. The area figures are those given in the Statistical Report of the Southwestern Region, U.S.F.S. for 1935, consulted at the Supervisor's Office in Tucson.

percent Douglas fir, White fir and spruce. They are practically untouched by the ax because of their inaccessibility.<sup>7</sup>

There is an interesting composite type to be found on this forest - western yellow pine, Douglas fir, and Colorado blue spruce occurring in a mixture. It is the occurrence of the blue spruce which is extraordinary. The type is found mainly between the altitudes of 8750 and 9200 feet on the Blue and White Mountains. Above 9200 feet the western yellow pine is lacking. Below 8750 feet the Douglas fir and spruce are not found. All the spruce has come in within the last 150 years, most of it within the last 100. The present yellow pine veterans were over 200, and the Douglas fir over 100 years old when the present spruce gained a foothold.<sup>8</sup>

The Coconino National Forest is the third largest in the state. In 1935 the net area was 1,726,541 acres, about three quarters of which lies in Coconino County and one quarter in Yavapai County. The forest takes its name from the Hopi word Kohonino, which was the name at one time applied to the Havasupai tribe of Indians of Cataract Canyon. It is at present characterized by the Forest Service

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7. Ibid., p. 6.

8. Greenamyre, Harold H., "The Composite Type on the Apache National Forest," Fort Valley Experiment Station, U. S. Forest Bulletin No. 125, (1913) p. 5-7.

as the "most accessible and most valuable of any of Arizona's National Forests." The Coconino lies on the Colorado Plateau, on both sides of the Santa Fe Railroad. This plateau is a large, comparatively flat area, at an elevation of 7000 feet, cut at the south end by several deep canyons. North of the Santa Fe Railroad, rising abruptly from the plateau, are the San Francisco peaks, the highest in Arizona.<sup>9</sup>

Originally the Colorado Plateau contained the finest body of western yellow pine timber in the Southwest, but because of its accessibility from the railroad much of this has been cut by large mills. A large part of that remaining is under contract for cutting by three large mills of the region, at Flagstaff, Cliffs and Williams. The supervisor's headquarters are at Flagstaff.

Coronado National Forest, fifth in size of the national Forests, with an area of 1,323,799 acres, lies in nine divisions, seven of which are in Arizona in Cochise, Pima, Pinal and Santa Cruz Counties, and two in Hidalgo County, New Mexico.

The Coronado region is composed of mountain ranges which for the most part rise sharply from the southern desert. The most important mountains in the forest are the

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9. U. S. D. A. Circular No. 318, op. cit., p. 7.

Santa Catalinas, Santa Ritas, Huachucas, Tumacacoris, Dragoons and Chiricahuas. The nine divisions are administered by the Supervisor at Tucson.

The forest has no extensive saw timber stands and can never become the source of supply for a large lumber industry. It does, however, contain considerable quantities of pinon and oak woodland which is of importance as a local fuel supply. The chief value of the Coronado National Forest lies in its protection of water sources, and in recreational uses for the people of neighboring towns. The particular importance of this forest to the public health is recognized by the Service which is opening up areas in the forest for summer residences and resorts, and is building roads and trails, telephone and sanitary systems, playgrounds and parking areas for motorists. The Catalina Mountain division, particularly, has been developed for this purpose.<sup>10</sup>

The forest is named for Don Francisco Vasquez Coronado, the Spanish explorer who, in 1540, crossed southern Arizona in his march from Mexico in the search for the Seven Cities of Cibola.<sup>11</sup>

The 1,422,804 acres comprising the Crook National

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10. Graves, Henry S., "Recreational Uses of the National Forests," American Forestry, Vol. 23, p. 134.

11. U. S. D. A. Circular No. 318, op. cit., p. 9.

Forest lie in six different counties, Cochise, Gila, Graham, Greenlee, Maricopa and Pinal. It is administered from headquarters at Safford, on the Gila River. Four of the five divisions are in the Graham, Galiuro and Santa Theresa Mountains. The other division consists of the mountainous country north and west of Globe. The forest is named after General George Crook, who was in charge of the United States Army in its operations against the Arizona Indians from 1871 to 1875.

Most of the saw timber of this forest is found on the Mt. Graham division. There, high up in the mountains, is one of the heaviest stands of western yellow pine and Douglas fir in the entire Southwest. It is inaccessible, and small in area, making cutting an expensive operation. Several small mills cut timber for use in the surrounding villages. The remainder of the forest contains little saw timber, but there are large areas of woodland which supply most of the fuel for the settlements adjacent to the reservation.<sup>12</sup>

The Kaibab National Forest of 1,771,327 acres, second in size, lies both north and south of the Grand Canyon in Coconino, Mohave and Yavapai Counties. The supervisor's headquarters are located at Williams, Arizona. The forest

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12. Ibid., p. 11.

takes its name from the Kaibab plateau upon which it is located. This plateau, in turn, is named after a small division of the Piute Indians who roamed there, and is said to mean "on the mountain."<sup>13</sup>

There are great resources of timber in this forest which produces a large amount of merchantable timber and supplies saw mills at Williams. Due to the wildness of that part of the forest which lies north of the Grand Canyon a great deal of game is found there. Elk and the mule deer are especially prevalent.

In Yavapai and Coconino Counties, lying in two divisions east and west of the town of Prescott (named in honor of the historian) lies the Prescott National Forest which is primarily a watershed protection. Most of the forest is on the watershed of the Verde River, which irrigates large areas of farm land. In the past the forest has furnished a great deal of timber, but it was badly cut over before the creation of the national forest and now has no extensive saw timber stands on its 1,253,831 acres.<sup>14</sup>

Sitgreaves National Forest lies in Apache, Coconino and Navajo Counties, stretching for nearly one hundred miles along the north side of the Mogollon Rim. It was

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13. Ibid., p. 12.

14. Ibid., p. 14, and also U.S. Dept. of Interior, Report of the Commissioner of the General Land Office, 1900, p. 81.

named after Captain L. Sitgreaves, of the United States Topographical Engineers, who headed a scientific expedition along the Zuni and Little Colorado Rivers in 1854. The supervisor's headquarters are at Holbrook on the Santa Fe Railroad.

This forest, although small in area, (800,510 acres), is one of the most heavily timbered in Arizona. Nearly all of the saw timber is Ponderosa. Only small amounts of it have been cut, for it lies far from the railroad.<sup>15</sup>

Largest of the eight national forests of the State is the Tonto, with 2,411,221 acres, lying in Gila, Maricopa, Pinal and Yavapai Counties, named for the Tonto Indians, a branch of the Apache nation. It is administered from Phoenix and was established largely for the purpose of protecting the watershed of the Roosevelt Reservoir, which furnishes water for irrigation of the great Salt River Valley. There is a considerable body of timber on the Mazatzal and Sierra Ancha Mountains and under the Mogollon Rim. Several mills cut timber from this forest.<sup>16</sup>

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15. U. S. D. A. Circular No. 318, op.cit., p. 15.

16. Ibid., p. 17. The Tusayan National Forest which lay in Coconino and Yavapai Counties, surrounding the town of Williams and adjoining the Grand Canyon National Park was incorporated into the Prescott and Kaibab Forests in 1935.

## Objectives in Timber Management

### Objectives for Timber Use

The objectives sought in the use of national forest timber are: first, to keep the land growing timber, since the greatest value of the national forests is not as a reservoir of old timber, but as land which is or will be growing wood on every acre chiefly valuable for that purpose. The harvesting of a stand and the growing of a new crop are considered together, and present cutting must promote future growth. The success of timber use is determined by the growth of wood, and the influence of the forest cover (or lack of it) upon stream flow and erosion.

Second, dangers to the new crop and the surrounding timber are to be removed. It is not enough to provide for the start of a new crop. That crop must be given the best possible chance. Every timber cutting increases the fire hazard and may increase the hazard from windfall or insects. Diseases are present in every old forest. Snags are usually a fire menace. It is part of the job of handling a timber-use to reduce these hazards by getting rid of insect-infested, diseased or dangerous dead trees, and especially to keep fire out of the woods during and after logging by disposing of the slash. This part of the job is not an end, but a means for securing growth.

Third, the largest and best crop possible is to be

grown. It is not enough to grow some timber. All that the land can produce should be produced, and in the kinds and sizes most needed by the people of the country. Present cuttings must, insofar as can be provided, result in a new stand better than the old in density, and in proportion to the valuable trees it contains. Young stands are to be thinned, to induce more rapid growth, rather than cutting heavily in mature stands to meet market demands.

Fourth, mature or deteriorating timber is to be put into use before it spoils, and the maximum use is to be made of trees cut. A log saved is as good as a log grown. Part of the job in timber-uses is to prevent waste, both in the use of trees cut, and by securing the cutting of trees or stands which are deteriorating from overmaturity.

Fifth, a steady and continuous yield of useful wood products from each national forest unit is to be obtained. The forests were created "to furnish a continuous supply of timber for the use and necessities of citizens of the United States." None will be "cut out" in a few years, leaving abandoned mill towns and sawdust piles as evidence of shortlived prosperity. This requires not only keeping cut-over lands in growth, but also the use of foresight in the rate of cutting.

Sixth, the disposal of national forest timber is to be an efficiently run business, meeting the practical

requirements of logging and manufacturing industries as far as the foregoing aims permit. This calls for standardized, up-to-date methods of appraising timber; for thoroughness, knowledge and reasonableness in drafting contracts and use-permits, and for firmness in administration.<sup>17</sup>

#### Methods Used to Attain Objectives

To keep the lands on the forests of Arizona growing timber requires much effort, for possibly no forests in the west show so small a percentage of regrowth and so slight a tendency to reproduction as do the forests of the Mogollon plateau in Arizona and New Mexico. This is due not entirely to the arid condition, as is popularly supposed, but to the continued occupancy of the country. The pine forests of Arizona with few exceptions nowhere antedate the early settlement of the country by the white race.<sup>18</sup>

Investigation of climatic conditions in an open park, and surrounding timbered areas was begun at the Coconino (Fort Valley) Experiment Station in January 1, 1909. Results have had important bearing on the difficult problem of reproduction in the Southwest. Experiments on light requirements of western yellow pine were also conducted

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17. National Forest Manual, Section 4-S.

18. Holsinger, S.J., "The Boundary Line Between the Desert and the Forest" Forestry and Irrigation, Vol. 8 (1902) p. 23.

which disclosed the fact that yellow pine seedlings in certain situations do not survive more than a few years, although it could not be determined whether this was due to a lack of light or to other causes.

Detailed studies of conditions under which reproduction of yellow pine takes place in the Southwest were completed on the Coconino Forest. The problem of securing natural reproduction of this species is one of the most important silvicultural problems of the region.<sup>19</sup>

The greatest mortality to seedlings results from drought and frost during the first season's growth. The effects of drought are more serious during and immediately before germination. Of the artificial factors affecting reproduction, the most important are cutting, disposal of brush, grazing and fire. Of these the most important is cutting. As a rule, no reproduction can be expected after a heavy cutting. This is not so much because of the removal of the seed supplies, as because of the removal of the influence exercised by the forest upon the physical conditions, especially temperature and evaporation.

Reproduction suffered severely from heavy sheep grazing in the first decade of management, and the only effective preventive measure for such damage was the total

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19. U. S. Department of Agriculture, Annual Report of Secretary, 1910, p. 390.

exclusion of sheep from areas to be restored until the seedlings had grown out of danger.<sup>20</sup>

Another of the purposes underlying the establishment and maintenance of the national forests is the protection of the water supply. The protective influence of the forest cover on sources of water supply is of importance to all industries using water from the streams rising in the forests. It is of special importance to the agricultural interests. The Tonto and Prescott National Forests at the headwaters of the Salt and Verde Rivers are maintained primarily for the purpose of watershed protection, and

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20. Pearson, G.A., "Reproduction of Western Yellow Pine in the Southwest," Forest Service Circular No. 174 (1910); "Influence of Age and Condition of the Tree Upon Seed Production in Western Yellow Pine," Forest Service Circular No. 196 (1912); "Relation Between Spring Precipitation and Height Growth of Western Yellow Pine Saplings in Arizona," Journal of Forestry, Vol. 16, p. 677-689 (1918); "Studies of Yield and Reproduction of Western Yellow Pine in Arizona and New Mexico," Journal of Forestry, Vol. 16, p. 273-293 (1918); "Acceleration of Growth of Western Yellow Pine Stands After Cutting," Journal of Forestry, Vol. 20, No. 6 p. 39-42 (1922); "Natural Reproduction of Western Yellow Pine in the Southwest," U.S.D.A. Bulletin No. 1105 (1923) and "Forest Grazing Control Aids Tree Growth," Yearbook of Agriculture, 1926, p. 386-388; "Grazing in Pine Woods if Excessive Checks Tree Growth," Yearbook of Agriculture, 1927, p. 351-353; "Grazing and Reforestation," Journal of Forestry, Vol. 25, No. 5, p. 529-541 (1927); "Forest Types in Southwest as Determined by Climate and Soil," Forest Service Technical Bulletin No. 247 (1931) and "Recovery of Western Yellow Pine Seedlings from Injury by Grazing Animals," Journal of Forestry, Vol. 29, Oct. 1931. Hill, R.R., "Effects of Grazing upon Western Yellow Pine Reproduction in the National Forests of Arizona and New Mexico," U. S. D. A. Bulletin No. 580 (1917).

therefore grazing on them is most carefully controlled to prevent erosion.<sup>21</sup> (See Figure 1.)

In a semi-arid region such as Arizona, development of every resource depends on the amount and usability of the water resources. Most of the water supply comes from the wooded mountains. Runoff from such vast areas where the rainfall is highest becomes concentrated in streams and underground basins on which the thirsty but potentially productive desert must depend for its water supply. The water supply in total is so small that only a fraction of the desert areas can ever be developed by irrigation, although these small areas now support one-half of the state's population. The future size of every town and industry, regardless of their other assets, hinges on the water supply. Owing to the fact that native vegetation, including trees, forms the natural ground cover that protects the soil, and because a dependable water supply can be destroyed through the removal of this protective cover, watershed management becomes the most important consideration in any program of planning for the perpetuation of renewable resources of the semi-arid country. Recognition of the importance of watershed protection by early conservation-minded statesmen accounts for the fact that the

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21. U. S. Department of Agriculture, Yearbook, 1914, p. 73.

large unforested part of the twelve million acres in the eight national forests of Arizona was originally placed under administration primarily to foster watershed management (i.e. controlled grazing).<sup>22</sup>

Protection of timber from insect hazards has been achieved by cooperating with the Bureaus of Entomology and Plant Industry, and with State agencies.

The Bureau of Entomology estimates that loss of trees killed by insects, and damage to them, and the resultant increase in fires in insect-killed timber, represents more than ten percent of the quantity and stumpage value of the total stand of merchantable timber in the United States at any given time.<sup>23</sup>

The beetle, Dendroctonus ponderosa, is the most destructive pest in Arizona's forests at the present time. In 1907 these insects were reported in Arizona's timber stands. By 1924 the danger had reached menacing proportions on the Kaibab Plateau where the hordes of beetles threatened to destroy the scenic beauty of the forest covered slopes of the Grand Canyon, as well as two billion feet of valuable timber.<sup>24</sup> In cooperation with the Bureau of Entomology,

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22. Cooperrider, op. cit., p. 59-60.

23. Hopkins, A.D., Insects in Their Relation to the Reduction of Future Supplies of Timber and General Principles of Control, Bureau of Entomology, Circular No. 129 (1910), p.3.

24. U.S. Department of Agriculture, Yearbook, 1922, p. 162, and Editorial, "A Great Forest Threatened," American Forests and Forest Life, Vol. 30 (1924) p. 360.

the Forest Service expended considerable sums to combat these beetles (\$9,000 in 1922; \$10,000 in 1932; \$25,000 in 1924) and particularly to forestall the destruction of the pine forests bordering the North Rim of the Canyon. The work has been relatively successful, although the beetles are not eradicated entirely.

## CHAPTER VII

### FIRE CONTROL ON THE NATIONAL FORESTS OF ARIZONA

#### Causes

Fire control has always been a serious problem in the management of forests, complicated as it is by a great variety of causes: lightning, railroad sparks, campers and loggers, and, no less serious, the hazards presented by incendiary fires started in the forests by individuals who oppose the restriction of their privileges.

Prevention naturally centers about the reduction of the hazards from human causes. A continual process of education is carried on among all classes of users of the national forests, and a vigorous program of law-enforcement is pursued to discourage incendiary practices which, however, far antedate the reservation of the forest lands by the Federal Government. The setting of fires by pioneer stockmen was a fairly common practice throughout the West, and was adopted perhaps from the Indians in the

belief that the ranges were thereby improved.<sup>1</sup>

Sometimes, too, the forests were burned to aid in clearing mineral claims, to scare out game, or to give employment to settlers as fire-fighters. These incendiary practices continued even after the creation of the reserves. In 1909 the Secretary of Agriculture reported that four percent of the forest fires of that calendar year were incendiary in origin, and that stockmen who thought the forests should be burned once every year or two, in order to prevent the accumulation of vegetable litter on the ground, had made serious proposals for the adoption of such a practice by the service. This would have made the reproduction of the forests impossible, and for that reason received no serious consideration.<sup>2</sup>

The extent of incendiary practices in Arizona, and the relative importance of this problem of cause as

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1. Holsinger, S.J., "The Boundary Line Between the Desert and the Forest," Forestry and Irrigation, Vol. 8 (1902) p. 24. This author reports that in Chaco Canyon a deep Arroyo cut through the sedimentary formation for a distance of more than thirty feet shows distinct strata of earth impregnated with charcoal, from five to twenty feet below the surface, over an area of many thousands of acres. Elsewhere the alluvial and silt deposits and forest trees show unmistakable evidence of numerous extensive forest fires which have occurred during many centuries. How far the occupancy of the prehistoric and historic tribes has retarded the progress of foresting, it is impossible to say, but it must have been no small factor.

2. U. S. Department of Agriculture, Annual Report, 1910, p. 376-377.

compared with others, may be judged from a study of the forest fire summary for a period of twenty-five years which appears in Table 5.

### Technique of Control

The technique of fire control must now be thoroughly and continuously worked out by the Service, and the details seem rather elaborate, yet the value of their preparation is reflected in the steady reduction of acreage in fire losses, although the actual number of fires, because of the increased use of the forests, has made no dramatic decline.

The control of fire begins, not on the forests, but in the various Supervisor's offices where detailed fire plans are annually prepared. These plans list each individual job which must be done to bring fire control on a given forest up to the acceptable standard. Each job is listed to show when, where, how, and by whom it is to be done. The fire atlas is the reservoir from which the basic data for the plan of action is drawn. It is kept by the supervisor, who constantly revises and adds to its contents as the reports come in from the rangers. This atlas includes maps and statistical tables which show the starting point of fires by classes; lightning zones; camper zones, and incendiary zones; a hazard map shows all fires over 40 acres in actual area by years; a visibility map shows each

guard station, classifying the areas covered into direct, indirect and blind; a forest type map; an hour-control map on which to check the distribution of fire-fighters; an improvement map, with a diagram of communication and transportation systems; an analytical study of individual fire reports, showing causes, and law enforcement measures taken.<sup>3</sup>

The plan is the program of attack to be followed in protection and suppression. It outlines for each man on the forest exactly what his job is, so far as fire is concerned, and what he is to do under any set of circumstances likely to arise, so that he does not need to wait for specific orders at the scene of trouble, nor be delayed for lack of proper tools in his sector.<sup>4</sup>

#### Application of Fire Control Techniques

To determine the practical application of the suppression and control methods, records of several Class C fires (those burning ten acres or more) were examined in the Supervisor's office at Tucson; namely, fires on the Coronado National Forest on June 4-22, 1910 which burned over approximately 15,000 acres, and on June 11-15, 1936 which

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3. National Forest Service Manual, Sec. 53-A.

4. Ibid., Section 54-A.

burned over about 715 acres.

A report of the first fire (1910) was sent by letter to the District Forester, accompanying the required statistical forms. The letter, signed by Acting Forest Supervisor W. L. Rogers, follows:

The Catalina fire, June 4-22, 1910 started at two points, approximately 8 miles apart, constituting for a time two separate fires. There is enclosed herewith a report on Form 874-6 on the major fire which was the only one entering the large timber. The other fire was confined to the oak type and was put under control about June 10. Eventually, however, the two fires joined, effecting one burned area. It appeared at the start as if the mountain range was doomed and the fact that the fire was kept clear of 90% of the pine timber I can only attribute to a very fortunate combination of circumstances, such as a favorable wind at critical times, chance in being in the right place at the right time, etc. Since there has been no fire of any consequence in the Catalinas in 24 years the reproduction is most excellent. The total area of the coniferous type burned is estimated to be 7,000 acres. In this area 90% of the reproduction, averaging 5 years of age, was lost, as well as one-half the dead and 10% of the green timber. The damage to the soil through washing on the steep slopes will be heavy, since the pine needles formed a most efficient protector. The damage in the oak type and at the lower elevations has not been estimated at this date. [In a later report, Nov. 2, 1910, the acreage burned in this fire is said to have been over 15,000.]

A fire of incendiary origin covering approximately two sections 4 miles south of Soldier's Camp also occurred during the hottest portion of the large fire. Owing to the fact that a Mexican returned to report it, enabling us to get on the ground promptly, it was put out in one night ...."

The methods used in controlling this serious fire are outlined in the report of November 2, 1910, by R. J. Selkirk:

The tools used were rakes, shovels, axes, forked sticks. In fires of this character, the rake is the

most useful and necessary tool ... the proportion of fire-fighting tools which we aim to maintain in the pine type is two rakes to one shovel, and four rakes to one axe .... It has been our experience that a piece of canvas about 8 ft. long by 3 ft. wide is much to be preferred to a gunny sack. The gunny sack is of little value unless thoroughly wet, and it is only occasionally that water is available. The canvas should be wet if possible, but works very well dry ....<sup>5</sup>

From this report it may be seen that suppression of this fire was a long process - it burned for eighteen days and destroyed most of the timber and reproduction on a tract of nearly 15,000 acres. Twenty-six years of experience in handling fires in the forests of the southwest made possible a very different report on a fire potentially quite as serious.

The following description of actual conditions, action taken, and reasons therefor, was submitted in a memorandum on the Sabino Canyon fire of June 11-15, 1936, made by the forest ranger, E. L. McPhaul, to the Supervisor of the Coronado National Forest.

June 17, 1936

Assistant Supervisor Sowell and I were at the Camp Lawton Boy Scout camp from 9 to 10 A.M. on June 11. As we returned to the Palisades Ranger Station the telephone operator came out and said the Sabino Transient Camp had reported a smoke

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5. These letters were examined in the office of the Supervisor of the Coronado National Forest. The first report was signed by the acting Supervisor, the second by the Supervisor.

about 5 miles northeast of camp. I called for the camp superintendent, Mr. Brady, and it was reported he was sending men to the fire. The Mt. Lemmon and Bigelow lookouts were called but the smoke was not visible from either lookout.

Mt. Bigelow picked up the smoke at 10:25 A.M. About this time it was reported all of the able bodied men from the transient camp and 25 CCC boys from SCS 15-A had been ordered out and that Assistant Supervisor Smith was leaving to take charge. Supervisor Winn phoned that I should stand by and await developments. He called at 12:40 P.M. and said Mr. Sowell and I had better start down, Mr. Sowell to report to the office, and for me to go directly to the fire. I arrived at the Sabino caretaker's station at 3:20 P.M. A pack outfit was there and I got them going as soon as possible.

By the time the chuck and water started, Mr. Sidney Smith of the Bureau of Entomology and 60 of his wild cotton pickers arrived. Arrangements were made and the men fed at the Transient Camp. Mr. Smith and I drove to the end of the Sabino road for a look at the smoke, while the men were eating. Fifty men were told to go to the lead of the fire and climb out of the canyon. The balance were to come up from the lower end. The report of the lineup on the men was phoned to Mr. Sowell at 6 P.M. and that I was leaving for the fire.

The lower end of the burned area was reached about 7 P.M. The fire was burning wild next to Sabino Canyon but I did not stop since it seemed logical to get to the lead fire as soon as possible. Twenty-five CCC boys were found near the lead of the fire about 8:30 P.M. They told me Assistant Supervisor Smith was back down the line. I found him coming back up the line about 9 P.M. I gave him the line-up on men, etc. He said if the men were doing what he had told them to do, we would get the fire before daylight. I told him there was too much fire when I came by the CCC boys, and we should have a look. We found them bedded down and the fire burning uncontrolled across a canyon. We got them out and I led them across the canyon and stopped the spread. The CCC boys were strung along the line and I was sure they could hold it.

Light was showing on the west side of the ridges and I started back over the line to camp

to see if a crew could be sent to the west side. Mr. Smith could hardly walk, but went with me. By the time we reached camp the fire was going on three fronts again. Mr. Smith and I talked the situation over and decided more supervision, men, and pack animals were necessary before we could hope to control the fire and hold the line.

I left the fire line at 1 P.M. and called Assistant Supervisor Sowell at 2:45 and told him the line-up. He said he was having 60 Tanque Verde CCC boys come in at 5 A.M. He also said it would be a good idea to have Bob Knagge and Ed Sharrah come from Mt. Lemmon in addition to Bill Williams from Palisades Ranger Station. Also called A.E. Walker on the River Road and hired 8 pack and saddle animals. He agreed to be on the job by 6 A.M. Mr. Sowell came out at 4 A.M. We sent a truck in for grain and hay, and one for chuck and packing equipment.

The CCC boys arrived at 5 A.M. They were equipped and sent out with a man to lead them in. Williams, Knagge and Sharrah arrived at 6 A.M. Mr. Sowell and Williams went on to the fire, and Knagge and Sharrah were held to take the WPA cotton pickers in. Mr. Sidney Smith and 170 of his cotton pickers arrived at 8:30 A.M. They were issued tools and started at 8:40 A.M. Mr. Smith and I drove to the end of the road to see if we could get a line up from below. Very little could be seen from the end of the road. I wanted to get back on the fire line but it would have been poor judgment to rush back until enough organizing was done to function without direct supervision .... The fire line was followed and every foreman and crew was shown what to do to make their line safe.

I reached Mr. Sowell on top between 2 and 3 P.M. The fire was controlled at 3 P.M. We stayed on the line and directed the work the night of the 12th .... Three CCC foremen from Madera Canyon and about 30 transients and cotton pickers arrived on the line at 12 midnight. They were allowed to rest until 3 A.M. Crews were then organized and put to work mopping up. They worked from the top down to camp. No serious breaks occurred during the night. Mr. Sowell left the top about 5 A.M. to send a bunch of men back to me from camp and then go in. We worked on until noon. Williams, his men from Mt. Lemmon and I started down, leaving Francis Knagge in charge of crew. We went around the east fire line

on the way in and found Ranger Sykes on the line and Messrs. Brisbin and Hughes in camp. . . . Returned to the caretaker station at 6 A.M. the 14th. Remained there until Bill Hughes came in with all of the men at 6 P.M. . . . I went up for a final look at the fire on the 15th. Left one man on until 4 P.M.

Conclusion: Probably the first thought of anyone reviewing the action taken will be that the fire was over-manned. [There were 355 men engaged in the fight.] But with the temperature over 100 and the steepness of the area burned, it is doubtful if 50% of the men were effective, and those only about half as effective as ordinary fire fighters in a cooler and more accessible elevation. By giving these handicaps due consideration, it is not believed that it was badly over-manned. If the fire had gone through the saddle in the east, or the one on the west, it would have been humanly impossible to have stopped it before it reached the top of the mountain. It is true some of the men did not get food when they were hungry, or water when thirsty, but it is not believed the percentage was larger than on most fires. We could not have fed them if we had not had access to the Transient Camp. The kitchen did not close for three days and two nights. All men coming in to camp were fed, besides the loads of food going out by pack train . . . . No one at any time had to wait for supplies or equipment when ordered from the Supervisor's office. The packers went night and day . . . .<sup>6</sup>

The techniques of detection and law enforcement were studied in reports of several smaller fires on the Cococino National Forest, and of an incendiary fire.

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6. This memorandum was examined at the Supervisor's office in Tucson. A copy of the Individual Fire Report filed on this fire will be found in Appendix C.

### Law Enforcement in Fire Cases

Size and type of horseshoe tracks were the clues which led to the apprehension of the individual responsible for a Class A fire (burning less than 1/4 acre) on the Coconino National Forest reported near Allen Lake on the morning of June 14, 1920. The record of this case reads:

.... The Mormon Lake fire guard was sent at once to this fire. Upon arriving at the fire, he soon put it under control, as it was very small. A search was then made for evidence as to the cause, as all the guards and rangers had been instructed to do as soon as a fire was placed under control. He at once found where a small camp fire had been made, numerous burro tracks, and one burro track with a missing left hind shoe, but no other evidence. The guard then trailed the burro tracks seven miles and finally found a camp and the burro with the missing shoe.

The owner at once admitted when questioned that he must have forgotten to extinguish his camp fire. He was then taken before the Justice of the Peace in Flagstaff and fined \$10. The missing burro shoe and the experience of the guard in trailing ... led to this conviction.

Sheep tracks were the means of tracing the responsibility for a second fire on the Coconino which occurred on July 9, 1920.

... at 4 P.M. a fire was reported west of Black Bill Park on the Coconino National Forest. The District Ranger upon arriving at the fire learned that a band of bucks belonging to the Campbell and Francis Sheep Company had passed through this section about the time the fire started. The tracks were then found but no other evidence was available. After a hard fight that night with many men, the fire was put under temporary control. The following morning at daybreak the Ranger started on the trail of the bucks.

At times these were very difficult to trail, due to the cinder formation of the country and the very high wind which at times covered up all

evidence of tracks. After an eleven mile ride he was able to overtake them with a lone herder. The Ranger then talked for about one hour before the herder admitted he had carelessly thrown a lighted match in the dry grass after lighting his cigarette. He stated he saw the fire start, and that he tried to extinguish it, but after working awhile he decided to move his sheep a little further distant from the fire. He then came back to the fire and made a second attempt to extinguish it, but it had grown beyond his control, so he drove his band of twenty-six bucks to the edge of Black Bill Park and camped for the night. A complete affidavit was secured from this herder. As arrangements could not be made to relieve the herder that day, he was allowed to continue with his sheep, and on the 11th was taken into Flagstaff to be tried. Due to the serious fire situation, his trial was held over until July 13, the defendant in the meantime spending three days in the county jail. The judge fined him \$25 and a suspended sentence of ninety days ....<sup>7</sup>

The case of incendiarism also involves the use of the forests by stockmen.<sup>8</sup> While it did not occur on an Arizona forest, it is safe to consider it typical of the sort of thing which happened in the early history of the national forests.

On Tuesday, Oct. 23, 1917, Supervisor John D. Coffman and four others, while returning from a fire on the Ivory Mill road discovered four separate columns of smoke rising on Knoll Springs Ridge, some distance to the south of them. The different fires extended lengthwise of the ridge for an approximate distance of one and one-half miles ....

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7. These two examples are taken from Illustrative Cases of Fire Law Enforcement, a mimeographed publication of the Forest Service, issued May 25, 1921. These cases are Nos. 18 and 19, respectively, in the bulletin.

8. Ibid., Case No. 23, Region Five, California National Forest. United States v. W. J. Davis, et al. p. 29.

The first move made was to telephone a Forest Guard ... and instruct him to come down Knoll Springs Ridge, observing any tracks in the trail and taking care not to obliterate them. The trail in question was a little used one, Warren J. Davis who made use of the ridge as a driveway, and an occasional hunter being about the only persons who travelled that way. At Elk Creek, the nearest settlement, Supervisor Coffman interrogated ... an employe of Davis', and was told that Davis was in the mountains and that he was uninformed as to the probable date of his return.

An examination of the Knoll Springs trail disclosed a number of cattle tracks and the tracks of horses. The horses were shod with sharp calks as was the habit of Davis, in contrast to the usual mountain practice of shoeing with "good enough" or ready-made shoes.

It was 8:30 P.M. before the investigating party had reached the point of origin of the fires and their search for tracks was carried on by lantern light. Deputy Supervisor Mace found where a man had reined in his horse, dismounted, and had turned his horse to mount again. The next morning measurements of the man and horse tracks were made ... the horse tracks were followed to the Davis ranch, and horses were found whose tracks were identical with those at the fire.

Davis, of course ... denied any knowledge of the fire. Previous remarks of Davis tended to show that he desired to burn out the ridge for a driveway, and were introduced in evidence .... The first trial resulted in an acquittal for West and a disagreement regarding Davis and Hulett, his helper. Prior to the second trial the Forest Officers, fortified by the defendant's testimony, picked up many small threads of evidence and finally secured a conviction. Davis was fined \$750 and Hulett \$250. Davis' grazing permit was also cancelled and as a result he was obliged to sell his winter range adjoining the forest ....

The favorable showing in the reduction of acreage burned (see Table 5) during the first and second periods covered in the Summary is undoubtedly due to the improvement in means of communication and transportation which resulted from the road and trail construction of the

decade 1921-1930 (See Table 2), and the marked reduction in man-caused fires to the program of education and strict law enforcement carried on by the Forest Service. The reduction in the number of Class C fires is due to the perfection of methods of suppression, which means that fires are detected, and put under control, before they assume large proportions, and destroy much tall timber.

TABLE 5  
 FOREST FIRE SUMMARY  
 NATIONAL FORESTS OF ARIZONA 1911-36

1. Number of Fires by Classes, Forest Area Burned

| N.F. Area Burned Acres | Class of Fire |      |      | Total Number Fires | Years     |
|------------------------|---------------|------|------|--------------------|-----------|
|                        | A             | B    | C    |                    |           |
| 240,902                | 2099          | 800  | 480  | 3,379              | 1911-1920 |
| 69,173                 | 3769          | 1543 | 341  | 5,653              | 1921-1930 |
| 15,562                 | 3687          | 1107 | 191  | 4,985              | 1931-1936 |
| 325,637                | 9555          | 3450 | 1012 | 14,017             | 1911-1936 |

Class A 1/4 Acre or less  
 Class B 1/4 Acre to 10 acres  
 Class C 10 acres or more

Average number fires in 26 years, 539  
 Average area burned over 26 years 12,525 acres  
 Average since 1920 5,296 acres  
 Average since 1930 2,594 acres

2. Causes of Fires during period 1911-1936

| Lightning | R.R. | Camp Fires | Smokers | Brush Burning | Incend-iary | Lumber-ing | Misc. | Years |
|-----------|------|------------|---------|---------------|-------------|------------|-------|-------|
| 1725      | 269  | 399        |         | 50            | 40          | 178        | 718   | 11/20 |
| 4007      | 57   | 427        | 814     | 77            | 49          | 99         | 123   | 21/30 |
| 4025      | 6    | 230        | 569     | 32            | 32          | 14         | 77    | 31/36 |
| 9757      | 332  | 1056       | 1383    | 159           | 121         | 291        | 918   | 11/36 |

All data taken from Fire Atlas and Annual Fire Reports.  
 Furnished by the Regional Forester, Albuquerque, New Mexico, March 12, 1937.

## CHAPTER VIII

### COMMERCIAL TIMBER SALES AND CUTTING

#### Historical Evolution of Timber Sale Policies

The national forest policy of timber sales has evolved through three periods. The first extended from the opening of the frontier to the passage of the Act of June 4, 1897 which gave the Secretary of the Interior authority to sell timber from the forest reserves. (Prior to that date there had been no legal method of securing timber in commercial quantities. Lumbermen had to resort to dishonest practices if they wanted to stay in business.) During this period the "Timber and Stone" Act of June 3, 1878 was passed. It was the first law to recognize the fact that standing timber had a value in itself, apart from the land on which it grew, and that the Government had the right to sell the land for its timber.<sup>1</sup>

Under the Act of March 3, 1891, extended February 13, 1893, the Commissioner of the General Land Office issued instructions for cutting timber on non-mineral lands. This privilege was limited to wood with a stumpage value of \$50 for one year, for one person, and the wood taken was to be

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1. U. S. Department of Agriculture, Yearbook 1907, p. 277.

used only for firewood, fencing, building, mining, agricultural or domestic use.

During the entire period (1862-1897) the commutation clause of the Homestead Law of 1862 permitted timber speculation, and the Lieu Land clause of the Act of June 4, 1897 permitted many persons and companies to exchange hundreds of thousands of acres of worthless mountain wastes for valuable timber, because their original grants had been included in areas set aside as forest reservations. A great deal of timber so acquired was ruthlessly cut without regard for the future of the forests. (See Figure 2.)

The second period of evolution in timber sale policies extends from the passage of the Act of June 4, 1897 to the transfer of the forests to the Department of Agriculture in 1905. The Act of 1897 marked the turning point in government timber sale policy. It provided for the control and administration of the forest reserves, and authorized the Secretary of the Interior to sell timber from them. Laws for the securing of timber from the Public Domain (i.e. under Act of 1878) were not applicable to the new reservations, but any person who needed timber for local use could obtain it by purchase from the government at prices which were as nearly as possible the actual value of the timber. No timber could be exported from the state or territory within which the forest reservations were located, and thus all timber sales were limited exclusively to local demands.

The regulations of the Secretary of the Interior consisted mainly in forbidding clear cutting and compelling the leaving of some trees for future reproduction, in preventing waste by ordering closer utilization of stumps and tops, and in directing the disposal of brush in order to guard against forest fires. These rules were practically without effect, because there were no technically trained foresters to outline them properly, nor an adequate force of rangers to compel obedience to them. The policy of the government with regard to the forests during this period was not, as it is now, to encourage the fullest use of the land, but almost exclusively to preserve them for the future.<sup>2</sup> This policy was thwarted to a considerable extent by determined consumers who cut timber without permission, regarding the trespass penalties as merely a part of the business transaction of securing the wood. The trespass cuttings were five times as large as the legitimate timber sales.<sup>3</sup>

The third period began in 1905, with the transfer of the national forests to the Department of Agriculture. The general timber sale policy of the Forest Service, as determined by Acts of Congress and regulations approved by the Secretary of Agriculture was to encourage the sale of

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2. Ibid., p. 280.

3. Ibid., p. 281.

dead timber, to sell live timber, unless its removal would make a second crop doubtful, or would reduce the supply below that required for local demands, or where it might injure the stream flow. With a few exceptions, timber could be exported from the state or territory where it was cut.

There are six methods by which the use of timber from the national forests may be authorized.<sup>4</sup> These are (1) administrative use, that is, constructing improvements on the forests themselves; (2) free use, to help local people, settlers, miners, prospectors, and residents by giving them timber, the removal of which will benefit the forests by reducing the hazards from fire, insects, or fungi, or improve the stands by thinning or removing undesirable species; (3) sales at cost, a special form of use provided for the benefit of settlers. Under this provision, any kind or class of timber whose removal is permissible under the management plan and silvicultural practice for the area may be sold for use on the farms at rates based on cost of administering the sale. This means of encouraging agricultural development takes precedence over commercial sales. (4) Timber may be given in exchange for that on timberlands privately owned. This is a special form of commercial sale

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4. National Forest Manual, Section 4-S and also Regulations S-22, 23, 24, 25, 26, 28 and 29; S-4 and S-31.

and is generally handled under the same policies. (5) Timber may be disposed of under a "timber settlement" authorization when it must necessarily be cut in connection with other uses of national forest land. (6) Commercial sales are the chief form of use through which the forests are kept growing timber and the grown timber put to use.

#### Basis of Commercial Sales

Speculation, both in standing timber and in cut-over lands (while the lieu-land law was in operation) was an evil which had attended the exploitation of the forests.<sup>5</sup> The chief reason why forest destruction, rather than forest conservation had held sway in the United States was clearly the individualistic economic system under which the natural resources of the country had been used. The forests, for the most part, had been used not as a crop or renewable resource, but rather as a mine, which could yield its wealth but once, and then must be abandoned. The policy of "cut out and get out" left in its wake a trail of devastated timber lands, abandoned fields, and deserted towns. Entire counties in the lake states, the East, and the South lost their largest industry and main source of taxable

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5. Dana, Samuel T., "Forestry and Community Development" U. S. D. A. Bulletin No. 638 (1918) p. 10.

wealth. Arizona has experienced relatively little of this form of waste, because thirty years ago the bulk of the timber lands became national forests in which cutting is adjusted to the rate of growth with a view to sustained yield,<sup>6</sup> and a stable lumber industry. (See Figures 3, 4, 5.) The timber lands of Arizona, under the plan of management now practiced in the national forests, are capable of supplying for all time the raw material for a much enlarged and diversified wood-using industry. Long before the remaining virgin forests of the state have been utilized areas logged during the past thirty years will be ready for a second harvest, and a succession of crops will be available at definite intervals thereafter.

### Cutting Methods

The cutting methods used in logging operations on Arizona forests depend upon the composition and character of the forest and the logging conditions. In forests where trees of all ages are mingled, old mature trees, thrifty trees of immature age, young saplings and small seedlings, the old trees are selected here and there, while those not yet mature are carefully protected and left for later

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6. Ibid., p. 2, and also Pearson, G. A., "Lumber Industry," University of Arizona Bulletin, op. cit., p. 178, as well as Editorial, "Forester's Report Sees Best Use of Soil as Goal in Public Forest Policy," American Forests, Vol. 38, (1932) p. 53.

cutting. This is called the "selection system." Each tree to be removed is selected and marked by a Forest Officer.

In some stands the trees are for the most part of the same age, and all mature. The selection system is not applicable under these conditions, and the procedure is to remove the stand in two or more cuttings, the first, in the nature of a thinning, removes from 50 to 60% of the stand. The second cutting occurs from 10 to 30 years later. This is called the "shelter-wood system" and the opening of the stand by the first cutting results in establishing a new crop under the shelter of the trees left standing.

In some instances where practically all the trees are mature and the conditions are such that the shelter-wood system is not applicable, all of the stand is cut, except a limited number of seed trees left either as scattered individuals, or in scattered groups. This system is known as "clear cutting." From 5 to 10% of the timber is left.<sup>7</sup>

Since there are said to be over three and a half million acres of accessible commercial saw timber in the state, of which only 16 percent has been logged, regulated cutting can go on for many years before it will be necessary to depend on the new growth for the lumber supply needed by

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7. U. S. Department of Agriculture, Annual Report, 1910, p. 383-384.

the twenty-eight active mills in the state.<sup>8</sup> (See Figures 8, 9.)

Present trends are toward less centralization and the large logging camp is passing. In fact, modern steam logging as practiced in the Northwest has never been advisable here. The familiar portable city of frame cabins lined up along a railroad track and housing hundreds of transient laborers is being replaced by many small crews operating with motor trucks over an extensive territory and manned largely by local residents from neighboring villages. Small portable mills saw the logs into rough lumber which, after seasoning, is trucked to concentration plants for finishing.<sup>9</sup>

#### Results of Policies

The stabilized conditions under which lumbering operations have been carried on in Arizona since the creation of the national forests, and the development of the timber disposal policy under which commercial sales are appraised, advertised, and made to the highest bidder, have aided in the development of more than one community in Arizona. For instance the Cady Lumber Company, when ready to abandon

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8. Pearson, G. A., University of Arizona Bulletin, op. cit., p. 178.

9. Ibid., p. 179.

TABLE 6

TIMBER CUT AND SOLD IN ARIZONA, 1909-1936

Part 1

| (All products reduced to<br>M feet B.M.) |                                  |         |                   |       |                 |        |
|--|----------------------------------|---------|-------------------|-------|-----------------|--------|
| Fiscal<br>Year                           | Commerical and Ex-<br>change cut |         | Cost Sales<br>Cut |       | Free Use<br>Cut |        |
|  | M.B.M.                           | Value   | M.B.M.            | Value | M.B.M.          | Value  |
| 1909                                     | 20,476                           | 40,200  | -                 | -     | 4,235           | 9,019  |
| 1910                                     | 34,762                           | 94,700  | -                 | -     | 4,874           | 11,415 |
| 1911                                     | 37,482                           | 96,793  | -                 | -     | 4,322           | 11,856 |
| 1912                                     | 47,208                           | 130,305 | -                 | -     | 4,619           | 10,159 |
| 1913                                     | 57,795                           | 161,412 | -                 | -     | 4,164           | 10,728 |
| 1914                                     | 57,131                           | 133,987 | 41                | 32    | 4,087           | 13,864 |
| 1915                                     | 39,160                           | 90,393  | 61                | 52    | 3,910           | 15,405 |
| 1916                                     | 44,164                           | 105,015 | 124               | 122   | 6,113           | 18,866 |
| 1917                                     | 52,450                           | 120,068 | 242               | 234   | 6,874           | 19,420 |
| 1918                                     | 74,338                           | 164,823 | 349               | 349   | 6,296           | 10,755 |
| 1919                                     | 41,282                           | 95,061  | 333               | 264   | 5,790           | 11,063 |
| 1920                                     | 53,144                           | 137,174 | 555               | 452   | 6,413           | 13,652 |
| 1921                                     | 45,444                           | 107,340 | 489               | 525   | 7,429           | 10,116 |
| 1922                                     | 36,255                           | 79,553  | 795               | 628   | 5,151           | 7,681  |
| 1923                                     | 57,967                           | 139,022 | 413               | 379   | 5,233           | 7,419  |
| 1924                                     | 41,349                           | 98,699  | 303               | 471   | 6,293           | 8,827  |
| 1925                                     | 48,823                           | 107,360 | 353               | 364   | 7,178           | 9,301  |
| 1926                                     | 32,390                           | 79,115  | 319               | 282   | 7,002           | 14,223 |
| 1927                                     | 43,249                           | 120,422 | 406               | 446   | 6,767           | 13,620 |
| 1928                                     | 72,609                           | 192,651 | 425               | 440   | 6,590           | 14,797 |
| 1929                                     | 119,913                          | 283,658 | 261               | 276   | 7,337           | 15,143 |
| 1930                                     | 126,176                          | 309,934 | 206               | 207   | 8,670           | 15,344 |
| 1931                                     | 82,717                           | 193,068 | 185               | 188   | 10,342          | 18,073 |
| 1932                                     | 59,064                           | 139,413 | 294               | 286   | 12,876          | 21,551 |
| 1933                                     | 77,556                           | 185,162 | 249               | 245   | 14,623          | 23,288 |
| 1934                                     | 49,331                           | 121,003 | 376               | 377   | 14,568          | 24,298 |
| 1935                                     | 44,566                           | 103,728 | 472               | 469   | 15,395          | 23,313 |
| 1936                                     | 98,301                           | 230,021 | 501               | 513   | 13,593          | 18,936 |

Note: Similar records are not available prior to 1909. The figures given by R. S. Kellogg, in Forest Service Circular No. 166 (1909) for lumber produced in Arizona from 1880-1907 are (in M. Bd. ft.) 1880 - 10,715 M. Feet B.M.

1890 5,320 "  
1900 36,182 "  
1907 72,134 "

Cost sales (S-22) in records first appear in 1914. Statistics furnished by Regional Forester, Albuquerque, New Mexico, March 12, 1937, from their "Quarterly Cut and Sold Reports."

TABLE 6

Part 2

| Fiscal Year | Sold - Commercial Sales |           |
|-------------|-------------------------|-----------|
|             | M.B.M.                  | Value     |
| 1909        | 13,107                  | \$ 18,196 |
| 1910        | 45,157                  | 128,435   |
| 1911        | 90,572                  | 273,966   |
| 1912        | 17,749                  | 29,430    |
| 1913        | 126,941                 | 321,877   |
| 1914        | 47,161                  | 98,496    |
| 1915        | 82,480                  | 196,235   |
| 1916        | 56,995                  | 157,573   |
| 1917        | 67,130                  | 161,118   |
| 1918        | 292,671                 | 650,905   |
| 1919        | 69,961                  | 138,896   |
| 1920        | 29,634                  | 66,280    |
| 1921        | 12,629                  | 33,849    |
| 1922        | 11,756                  | 22,619    |
| 1923        | 38,290                  | 99,617    |
| 1924        | 93,260                  | 226,158   |
| 1925        | 62,003                  | 166,279   |
| 1926        | 434,320                 | 1,187,593 |
| 1927        | 91,700                  | 209,950   |
| 1928        | 9,276                   | 18,289    |
| 1929        | 202,120                 | 454,002   |
| 1930        | 11,506                  | 27,313    |
| 1931        | 107,010                 | 400,389   |
| 1932        | 5,229                   | 10,267    |
| 1933        | 114,552                 | 231,287   |
| 1934        | 4,659                   | 11,518    |
| 1935        | 79,035                  | 128,706   |
| 1936        | 122,951                 | 259,101   |

its "timber mining" operations in Mc Nary, Louisiana bought the site of the town of Cooley, Arizona, and there set up another Mc Nary, to house the population of the first town which they transported bodily to the new area.<sup>10</sup>

Mc Nary, Louisiana, picked up and taken to Mc Nary, Arizona, symbolized the tragedy of the old method of handling timberlands. As the forests became denuded of their pines, the employers of the villagers began looking about for a new site. They found it in Arizona, where they contracted for the purchase of extensive stands of timber on the national forests and the Indian Reservations of the region. This timber, however, was to be cut under specifications to protect the forest from denudation and insure reproduction and a second crop 25 or 30 years later, instead of a desert. The cutting began in 1924, and still proceeds at an orderly rate. The future of the lumber-town is assured for as many decades as the company cares to operate in compliance with the requirements for cutting timber on the national forests.

Another timber-sale involving over six hundred million feet of timber on the Sitgreaves Forest made possible the building of a railroad into the towns of Snowflake, Show Low, and others which had been dependent on wagon freight

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10. Chapman, H. H., "Why the Town of Mc Nary Moved," American Forests and Forest Life, Vol. 30, p. 589-592, (1924).

haul for transportation of all their supplies.<sup>11</sup>

Negotiations to open up an immense body of several billion feet of western yellow pine on the Sitgreaves Forest began in 1913. The timber lay on a high, rolling plateau bounded on the south by a vertical cliff (the Mogollon Rim) which extended southward from the Coconino National Forest where the Santa Fe Railroad crosses it. Eastward the timber belt trends constantly away from the railroad and becomes inaccessible until it terminates in a wilderness in New Mexico which is in the region of the Datil and Gila National Forests, one of the least developed portions of the entire United States. The Sitgreaves Forest occupies a long section of this belt, fully 60 miles from the railroad and to the south. In that direction lies the White Mountain Apache Indian Reservation, equally well forested. North of the forest were barren plains, along the water courses a few small Mormon settlements, Snowflake, 30 miles from the railroad, Show Low, 20 miles farther on, and others beyond. These towns needed a railroad, but their resources and population were too meager to justify the construction of a line. The one way in which the country could be opened up was by logging and manufacturing the timber to make freight for the road.

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11. Chapman, H. H., "A National Forest Timber Sale and Its Purpose," American Forestry, Vol. 24, p. 25-28, (1918).

At least six hundred million board feet had to be assured to provide a continuous revenue for twenty years which would guarantee a fair percent on the railroad investments, estimated to require a million and a quarter dollars.

The timber standing upon the national forest lands amounted to but 235,000,000 board feet, but across the forest boundary to the south, on the Indian Reservation, lay 400,000,000 feet of the same kind of timber. If the purchaser of the first body of timber could be assured of buying the Indian timber, the overhead costs of railroad, mill, logging roads, engines and other equipment amounting in all to two million dollars, when distributed over this large quantity of timber would be so reduced for each 1000 feet that after paying a reasonable rate of interest to the purchaser, a margin of value would still remain.

In 1918 application for the timber was made by residents of Arizona and New Mexico. Identical contracts were drawn up for each Department, and the timber on the Indian Reservation and the national forest was advertised for sale simultaneously, for a period of two months. But one bid was submitted, and that was by the local men. The bid was for the minimum price set upon the timber by the appraisers. Evidence of subscriptions in cash of \$225,000 was submitted by the buyers, and the contract was executed by the government. The project was immediately begun, under cutting plans which were to take twenty years for the removal of

the timber on the sale area, while there was available at least four times as much timber on the remainder of the Sitgreaves Forest, not reached by this sale, but held in reserve to furnish an equal annual cut for the next hundred years. By that time the "black jacks" left in the first sale will be ready to cut and the yield of timber from the forest will thus be made perpetual.

This timber sale meant first, prosperity and railroad transportation for an otherwise hopelessly isolated district; second, it meant a great increase in the supply of timber products, estimated (1918) to amount to over 30 million feet per year, and third, the opening up of a beautiful mountain region. No better illustration can be shown of the ideals of public administration toward which the pioneers of the Forest Service were constantly striving.

## CHAPTER IX

### MANAGEMENT OF GRAZING LANDS ON THE FORESTS OF ARIZONA Part 1. 1862-1905

#### Role of Grazing Problem in Forest Administration

The grazing resource of the national forests is second in importance only to the timber resource. The problem of managing the grazing lands on the national forests has been one of the most difficult to solve. Unlike the timber resources, the range was in practically full demand from the time the forests were first set aside by the Federal Government.<sup>1</sup> When the forests were established, abuse of the range had gone much further than abuse of the timber. Because of the deterioration already existing, because there was immediate demand for most of the forage, and because the forage crop was produced and harvested each year, the opportunity for realizing immediate results through constructive administration was greater in the case of range management than in the case of forest management.<sup>2</sup> The problem has many ramifications, and is closely integrated with the problems of agricultural use, watershed protection, conservation of timber, and marketing of cattle

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1. See Table 7. A comparison of the number of permittees from year to year demonstrates this point quite conclusively.  
2. U.S. Department of Agriculture, Annual Report of the Secretary, 1911, p. 91.

TABLE 7  
 GRAZING STATISTICS  
 (As shown in Annual Reports, U.S.D.A. and U.S.F.S.)

| F.Y. | Pmts. | Cattle  | Horses | Hogs | Pmts. | Sheep   | Goats  | Ex-empt   |
|------|-------|---------|--------|------|-------|---------|--------|-----------|
| 1906 | 581   | 30,096  | 67,718 |      | 87    | 347,208 |        |           |
| 1907 | 769   | 36,517  | 80,153 |      | 103   | 287,368 |        |           |
| 1908 | 1076  | 158,496 | 8,812  | 403  | 148   | 350,387 | 31,704 |           |
| 1909 | 1599  | 225,181 | 10,765 | 425  | 195   | 491,090 | 21,090 |           |
| 1910 | 1659  | 224,895 | 9,709  | 619  | 187   | 427,042 | 12,045 |           |
| 1911 | 1658  | 221,128 | 10,020 | 228  | 170   | 421,529 | 7,186  |           |
| 1912 | 1681  | 241,334 | 8,218  | 361  | 183   | 415,074 | 7,323  |           |
| 1913 | 1838  | 258,537 | 8,776  | 332  | 182   | 445,587 | 8,385  |           |
| 1914 | 1654  | 262,650 | 7,973  | 645  | 148   | 391,931 | 6,201  |           |
| 1915 | 1793  | 288,875 | 7,900  | 565  | 144   | 389,657 | 4,490  |           |
| 1916 | 1519  | 286,252 | 7,764  | 484  | 129   | 366,902 | 3,030  |           |
| 1917 | 1504  | 310,813 | 7,211  | 267  | 129   | 369,307 | 4,765  |           |
| 1918 | 1518  | 334,063 | 6,773  | 1075 | 159   | 427,873 | 5,580  |           |
| 1919 | 1570  | 360,011 | 6,509  | 637  | 160   | 364,853 | 6,604  | No fees   |
| 1920 | 1585  | 346,734 | 4,870  | 563  | 139   | 346,046 | 5,742  | chg'd frn |
| 1921 | 1482  | 360,038 | 4,306  | 492  | 140   | 316,447 | 4,030  | domest.   |
| 1922 |       | 296,094 | 3,302  | 295  |       | 295,409 | 670    | stock     |
| 1923 |       | 288,176 | 3,232  | 354  |       | 278,774 | 850    | 22,625    |
| 1924 |       | 273,999 | 2,480  | 296  |       | 247,235 | 7,330  | 20,240    |
| 1925 | 1327  | 248,239 | 2,909  | 321  | 99    | 271,958 | 627    | 23,512    |
| 1926 |       | 227,198 | 2,539  | 271  |       | 257,575 | 1,140  | 21,551    |
| 1927 |       | 207,517 | 2,631  | 268  |       | 337,786 | 1,796  | 21,097    |
| 1928 |       | 186,277 | 2,231  | 460  |       | 286,231 | 1,766  | 19,495    |
| 1929 |       | 181,125 | 1,951  | 355  |       | 351,221 | 1,397  | 18,631    |
| 1930 | 1042  | 172,024 | 1,533  | 272  | 125   | 352,368 | 426    | 11,073    |
| 1931 |       | 178,900 | 1,427  | 196  |       | 331,329 | 3,345  | 10,778    |
| 1932 |       | 181,388 | 1,391  | 157  |       | 262,652 | 1,786  | 10,460    |
| 1933 |       | 185,711 | 1,321  | 115  |       | 361,013 |        | 10,824    |
| 1934 |       | 188,683 | 1,018  | 80   |       | 245,189 | 10     | 10,629    |
| 1935 | 1037  | 183,683 | 922    | 53   | 92    | 253,117 | 0      |           |
| 1936 | 1046  | 175,330 | 1,005  | 50   | 91    | 270,029 | 600    | 11,282    |

Statistics for period from 1923 to 1934 were secured from the office of the Forest Supervisor at Tucson. "Report of Statistics in 1931," covers period from 1923-30, inclusive; "Report of Statistics in 1935" covers period from 1931-34, inclusive. Report for 1935 secured from Forester's Annual Report, 1936.

In 1925 it was estimated that the National Forest Ranges were caring for approximately 20% of the cattle and 30% of the sheep. Permit and fee not required for animals under 6 months of age, of which it is estimated that calves accompany 50% of the cows, and lambs accompany 70% of the sheep, and graze without charge. (Forestry Almanac, p. 10.)

at a profit, in spite of a heavy freight differential, on the Eastern markets.

Western ranges, of which there are 728 million acres, extend over three-fourths of the land area of the western half of the United States.<sup>3</sup> Approximately 376 million acres of this total are in private ownership; 151 millions are federal lands, such as the unreserved public domain, grazing districts under the Department of Interior (since the Taylor Grazing Act of 1934) and other withdrawals and reservations. Eighty-eight million acres are included on the national forests, and the remainder lies upon Indian, State and County lands.

With the exception of the lands within the forest reserves there was, prior to 1934, no regulation of grazing practice upon any of the federal lands, and practically none on privately owned lands. The Forest Service administration of grazing lands represents the initial effort of the Federal Government to undertake, on a major scale, the management of land resources which it is in the general interest to retain in public ownership.

The traditional western attitude toward natural resources was based upon the philosophy of their inexhaustibility. The profit motive in the stock business,

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3. The Western Range, p. vii and p. 349. U.S. Senate Document No. 199, 74th Congress, Second Session.

coupled with ignorance of a sound basis for determining grazing capacity had led to consistent over-stocking. Serious depletion of the forage grasses had resulted from failure to provide for their wise use and perpetuation before the creation of the reserves.<sup>4</sup>

Certain land policies unsuited to semi-arid and mountain grazing lands of the west had opened the way to the destructive practices of the stockmen. The policy of passing as much land as possible into private ownership, regardless of its character, and the unmodified application of land laws, suited only for humid regions, to the radically different semi-arid west, has been an important factor in producing this destruction.<sup>5</sup>

#### Competitive Conditions

The financial handicaps of freight and marketing differentials have caused the western stockman to take advantage of his outstanding competitive opportunity - the use of cheap feed from natural ranges. These ranges have been abused by overstocking in an effort to reduce the costs of production. The resulting destruction of the cheap range feed has forced the stockmen to use high-priced hay as a supplemental feed. This, in turn, has

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4. Ibid., p. 10.

5. Ibid., p. 11.

necessitated the use of irrigated crop lands for the production of hay and feed. It is estimated that in 1936 about 35% of the stock feed used in western states was produced in this manner, a three-fold increase in the course of 45 years (1891 to 1936) and western agriculture, except for highly specialized crop farming, is now primarily an integration of range livestock grazing and crop farming.<sup>6</sup> Investments in crop and range land have had to be made under competitive conditions, and often at so high a price as to make the livestock-converting part of the enterprise unprofitable.

Extensive areas of the range lands which were included in the national forests had been seriously depleted by the free-for-all use which had gone on for several decades prior to their establishment, yet, because of the character of the lands, and the importance of the stock industry in the national life, the range on the national forests could not be entirely withheld from use.

The problem of restoring these lands to full productivity was one of the first to confront the Forest Service. Solving the problem has been complicated by the fact that the policies adopted affected the interests, and aroused reaction not alone of the users of various types of federal

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6. Ibid., p. 17.

range lands, but also of the users of state-owned and private lands.

From 1906 to 1936 it is estimated that private range land had gone down-grade 85%, state and county-owned 88%, and Indian lands 75%, while only 5% of the national forest ranges had done so.<sup>7</sup> Only 95 of the 728 million acres of the entire range area were in a satisfactory condition in 1936. Nearly half of the acreage in this category was on the national forests, and about 12% in private ownership.

#### Objectives in Management

The primary objectives for the administration of the national forests were timber conservation and watershed protection. The policy was never one of "locking up" resources, but rather one of conserving them for use. Within the limits of a conservative policy which would protect these national resources the needs of a major industry had to be served. Hence, in the forest reserve problem, grazing has always played about as important a part as forestry, and for this reason must receive careful consideration.<sup>8</sup>

Remedies used by the Service have included placing all range lands on the forests under management to stop

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7. Ibid., p. vii.

8. Ise, John, United States Forest Policy, p. 168.

depletion, restore, and then maintain in perpetuity, the forage resources, while at the same time permitting their use.<sup>9</sup> This has involved drastic reductions in the number of stock on over-grazed ranges, and a great deal of research to determine methods of reseeding and protecting the grass. It has also required far-reaching adjustments in the size of ownership units; and the placing of jurisdiction on a sound basis, where responsibility may be concentrated. The application of these remedies on the forests has raised the same questions in connection with the other classes of public lands. The policies which have proved successful on the forests have finally resulted in the extension of a similar plan of control to the public domain, through the grazing districts established under the Taylor Act of 1934, by the Department of the Interior. This marks the first success of a thirty year struggle to conserve the resources on the unreserved public domain as carefully as they are being conserved on the reserved portions.<sup>10</sup> The Forest Service has blazed the way by demonstrating the practicability of control measures.

#### Scope of This Study

The scope of this study includes only those phases of

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9. U. S. Senate Document No. 199, op. cit., p. v.

10. Barnes, Will C., The Story of the Range, U.S.D.A. 1926 and Butler, Ovid, American Conservation in Picture and Story, p.139.

the problem which are directly related to forest management, and the evolution of forest policies in the face of criticism on the part of the stock industry.

### Historical Course of Range Use in Arizona

In Arizona stock-raising is the third most important industry, and between 25 and 30% of the range available for cattle is to be found on the national forests. A resume of the historical course of range use within Arizona, before the creation of the national forests, will provide the background for a closer scrutiny of national forest administration.

### Three Periods of Intensive Use

The period of continuous grazing on Arizona grass lands opened in 1700 when Father Eusebio Kino, the Jesuit missionary, brought livestock into Arizona for the use of the missions he founded. These missions soon became centers for a vast stock-raising industry.<sup>11</sup>

The real beginning of the cattle range as it is thought of today, however, dates from the close of the Civil War, and the return of the military to the Southwest.<sup>12</sup>

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11. Haskett, Bert, "Early History of the Cattle Industry in Arizona," Arizona Historical Review, Vol. 6, p. 4, (1935).  
12. Hall, Sharlot, "Old Range Days and New in Arizona" Out West Magazine, Vol. 28, p. 182, (1908).

The government was the first patron of range-beef, and the first herds trailed into Arizona came from California and Texas to feed the soldiers.<sup>13</sup>

The building of the two great transcontinental railways across the territory in the late 70's and early 80's was the chief factor in opening the ranges in the north and south to the cattlemen.<sup>14</sup> An era of intensive use in Arizona opened with the great boom in range cattle which was on the upswing throughout the western states in the 1880's. Many cattle companies were organized, and by the middle of that decade Arizona's wide ranges were practically all under use and in many cases depletion had already begun to show itself.<sup>15</sup> In 1870 there were about 30,000 cattle on Arizona's ranges; in 1880 about 142,000; and by 1886, 502,000.<sup>16</sup> Cattle production in Arizona seems to have reached its peak in 1891. Although the census reports for 1890 showed but 263,248 head, the total number on the assessment rolls for the counties in 1891 was 720,941 head. In the opinion of men who knew the facts this was still far below the actual number, which was closer to 1,500,000.<sup>17</sup>

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13. Haskett, op. cit., p. 19.

14. Ibid., p. 25. Lists of the owners of brand names in the early 80's are given by this author on pages 31-35.

15. Ibid., p. 40.

16. U. S. Senate Document No. 199, op. cit., p. 119.

17. Haskett, op. cit., p. 41-42 should be compared with Hall op. cit., p. 191.

The consequence of this overstocking and ruthless use was that no range land was held in reserve for dry years, and so, when the great drought years of 1892 and 1893 came, cattle losses were extremely heavy, estimated by some to have been 50%, and by others as high as 75%.<sup>18</sup>

The sheep industry had expanded in much the same way as the cattle industry. During the California drought of the 70's thousands of sheep were driven into Arizona to graze on the western ranges of the territory. Sheep raising in the northern part of the territory began in 1875, and by 1890 was a major enterprise there.<sup>19</sup>

#### Competition for the Range

Arizona was an open range country in all that the term implies during the 80's. The result was contention between the cattle and sheep men over the use of the range, most of which was public domain. The Pleasant Valley range war in the Tonto Basin was the bloodiest between cattle and sheep men in the Southwest.<sup>20</sup> The sheepmen had the priority right of occupation in the north, the cattlemen in the south of the territory. As conditions on the range became more severe, there was a tendency for the sheep herders to

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18. Ibid., compare p. 42 of Haskett with p. 193 of Hall.

19. Haskett, Bert, "The Sheep Industry in Arizona," Arizona Historical Review, Vol. 7, p. 24 (1936).

20. Ibid., p. 26.

encroach upon the cattle lands, and also for out-of-state owners to drive both cattle and sheep onto the southern ranges.

In February, 1892, the cattle growers met at Flagstaff to protest against the encroachments of sheep on their ranges and action was taken to secure legislative regulation of the movement of sheep without adequate range rights on recognized cattle lands.<sup>21</sup> Clashes between the two groups continued as range conditions grew steadily worse, and there were other attempts to secure relief from the Federal Government, since most of the land involved was public domain.

#### San Francisco Mt. and Black Mesa Reserves, 1896

The creation, by executive proclamation in 1896, of the San Francisco Mountain and the Black Mesa Forest Reserves (now the Coconino, Apache and the Sitgreaves National Forests) aroused great opposition among the stockmen, for these areas contained the best summer grazing lands in the territory.<sup>22</sup>

The conditions in this region had been greatly aggravated by the unsuitable land policies of the period which

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21. Ibid., quoting from the Coconino Sun, Feb. 25, 1892.

22. Ibid., p. 37.

had enabled land speculators to gain control of vast stretches of forest lands. The railroad grants of alternate sections also added to the confusion, since many cattlemen had leased these lands for grazing purposes.

The speculators, railroad men, and leaseholders, activated by a desire to exchange their comparatively worthless sections (from which most of the timber had been cut) for more valuable ones under the Lieu Selection Law, took advantage of the opportunity to agitate the grazing question among the small cattlemen and the settlers in and near the lands included in the reserves. By so doing they hoped to force the government to take over all of their "checkerboard" sections. In order to insure this, they determined to make the efficient administration of the reserves an impossibility by arousing the antagonism of small settlers and landholders. Accordingly, they told these two groups that their interests were at stake; all livestock would be excluded from the reserves; no timber whatever could be cut; they might be compelled to move from their homesteads within the reserves. Rumors of all kinds spread rapidly. Settlers were made to feel that<sup>23</sup>

...they had come into the country, made the Indians 'good' and the country fit to live in; the government

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23. Breen, F. S., "Forest Reserves as Seen at Close Range," Forestry and Irrigation, Vol. 13, p. 182 (1907).

had invited them to come in where land was free, to make their homes and develop the country. Now, after years of hardships incident to pioneer life, the government stepped in and took away their free range and timber, and put them on a reservation the same as Indians.

The men who were sent to administer the reserves met with exceedingly cold receptions. The Williams News went so far as to carry an article suggesting that the best method to adopt for retaliation against the government was "to hang these U. S. tree agents to the trees that they had come to save."<sup>24</sup>

As a result of the fear and uncertainty which these rumors aroused, the sheep growers of the region organized themselves with the object of protecting their interests against extending government control. They carried their propaganda throughout the territory, the western states, and on to Washington. On February 13, 1899 a petition was presented to Congress by Senator Warren of Wyoming, praying that grazing be allowed without restriction on public lands in the west. The following day Marcus A. Smith, the Territorial Delegate in Congress for Arizona, presented a similar memorial from the legislature of his own territory, favoring the repeal of all laws prohibiting the grazing of live stock on the public domain.<sup>25</sup>

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24. Haskett, op. cit., p. 38.

25. Congressional Record, Vol. 32, Part 2, 55th Congress, 3rd Session, Feb. 13, 1899, p.1781 and Feb.14,1899, p.1879.

As the condition of the western grass lands became known opposition to the use of the forests for sheep grazing grew among conservationists throughout the country. It was most pronounced at Washington in the Department of the Interior, and in the American Forestry Association.

The propaganda against the grazing of sheep on the forests threatened to ruin the sheep industry. In an effort to explode what they termed the "myth" of the greater destructiveness of sheep-grazing as compared with cattle-grazing, the Arizona Wool Growers' Association carried its fight to Washington. Early in 1899 it was reported by J. F. Wilson, Arizona's delegate to Congress, that Secretary Hitchcock of the Department of the Interior had declared his intention of excluding all livestock from grazing on the forest reserves in Arizona. Before definite action was taken on the matter, however, E. S. Gosney, the President of the Arizona Wool Growers' Association, and Albert F. Potter, a cattleman from Holbrook, conferred with the Secretary and secured his promise to permit the various classes of livestock to graze on the forests in the usual manner during 1900.<sup>26</sup> Meanwhile, grazing conditions were to be investigated by experts from the Department of Agriculture, and a report made which would serve as a basis

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26. Haskett, op. cit., p. 40.

for settling the question. When, by the spring of 1901, this report had not been made public, it was generally believed that sheep grazing was at an end on the forest reserves of Arizona.

There were many forest fires in the northern part of Arizona during the early summer of 1901. Those who were fighting for their grazing rights on the forests said,<sup>27</sup>

... the loss by fire is infinitely greater than any grazing by cattle could cause, and the less grazing done, the more frequent will the forest fires become. The department may find this out some day, and then again it may not.

#### Regulative Measures Under the Department of Interior

By the fall of 1901 other features of the government's plan were being discussed. These were the restriction of the size of herds by proportional area assignments of the range, and the charging of a fee for the privilege. To the first, the charge was made that restriction of the size of herd, which would result from restriction of available range areas, would prevent profitable expansion and favor the large stockmen unduly.

To the second, the contention that government land ought to yield revenue, it was said that this would be

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27. Southwestern Stockman, Farmer and Feeder, Editorial, July 4, 1901.

unjust, since settlers were already paying more than the intrinsic worth of their claims on the belief that they could use the open land free. No settlements would have been made but for the permission of the government to use the open range. Under the implied contract, the ambitious, industrious cattlemen had filled up these districts - under these contracts communities had flourished. These things all resulted from dividing these lands up among small cattlemen, and could all be undone as easily by placing the resources of the country in the hands of a few heavy ranchmen and monopolies under the proposed land lease system.<sup>28</sup>

In an address before the meeting of the National Live Stock Association in Chicago, in 1901, Gifford Pinchot, Forester in the Department of Agriculture, and one of the investigators whose report Secretary Hitchcock had withheld, said:<sup>29</sup>

.... Together with irrigation, the grazing question is today decidedly the most important problem of the National Forest Reserves. .... Any adequate consideration of the grazing question must be based upon the following propositions: first, all the resources of the Forest Reserves, large and small, should be wisely used for the good of the people; second, grazing is primarily a local question, and should always be dealt with on local grounds; third, overgrazing destroys both the forest and the range. The

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28. Southwestern Stockman, Farmer and Feeder, October 11, 1901. Abstract of Article by L. B. Unkefer, p. 1.

29. Southwestern Stockman, Farmer and Feeder, December 20, 1901. Address of Gifford Pinchot reprinted.

avoidance of it is equally to the advantage of forest protection and of the grazing interests ... fourth, the continuance of the water supply ... is inseparably bound up with the preservation of the forests ....

The climax of the matter was reached in 1902 when a committee made up of the land commissioner for the Santa Fe Railroad (owners of the alternate sections in the area covered by the checker-board reserve in the San Francisco Mountains) their Washington attorney, and several citizens who claimed to represent the farmers of the Salt River Valley (for which the reserve constituted a watershed protection of vital importance) called on President Roosevelt and prevailed on him to approve Secretary Hitchcock's order excluding sheep from the forest reserves in Arizona. Consternation prevailed in Northern Arizona when rumors of the matter leaked out. The ruling would have ruined the sheep industry, practically the sole enterprise in several counties there. The order was never published, but the railroad lobby had served its purpose. The railroad's alternate sections were made a part of the reserve, and the lieu-land speculation was perfected.<sup>30</sup>

In the summer of 1902 the government adopted a plan:

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30. The facts relating to this controversy between the Department of the Interior and the sheep men are recounted by Haskett, op. cit., who bases his material on the Gosney Mss. on file in the office of the Arizona Pioneers' Historical Society.

for cooperative regulation through the wool-growers' associations and the cattle-men's organizations. When they represented a majority of the interested parties in a given region, these bodies were to be allowed to recommend the allotment of permits, providing they would see that the permittees complied with all the rules and regulations. A qualified organization of sheepmen existed in Arizona, but the cattlemen of the territory were without any.

Under this cooperative plan, sheep-owners were to have the exclusive right to their range, under permits which would run for five years. Residents were to have preference over owners from other states. Local cases were to be decided on local grounds, and on their own merits. The policy of the government was to be based on regulation, rather than prohibition, it being understood that the prevention of overgrazing was equally in the interest of all parties.<sup>31</sup>

The publication by F. S. Breen, Forest Supervisor, of these regulations for cooperative management did not, however, mean that the grazing of sheep was to be permitted. The announcement concluded with the reminder that "all sheep are at present excluded from the reserves [in Arizona]

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31. Resume of the stipulations of the cooperative agreement published in the Southwestern Stockman, Farmer and Feeder, Feb. 14, 1902 over the name of F.S. Breen, Forest Supervisor.

and must remain outside the reserves until orders are received [from Washington] permitting them to enter."

The reasons given by the Department for restricting sheep grazing were that they caused greater damage than cattle and horses,<sup>32</sup> but that did not satisfy the sheep men who were smarting under the prohibition. They felt that they were having a tough time, and were being unfairly discriminated against just when wool prices were excellent and the outlook otherwise very bright.<sup>33</sup>

Sheepmen disliked the actions of Forest Supervisor Breen and alleged through the columns of the Southwestern Stockman, Farmer and Feeder that he was arbitrary and unfair.<sup>34</sup>

... we do not object to Mr. Breen running the forest reserves as he may deem best, or most in accordance with his wishes, but it certainly would look a little better to have the matter carried on in a manner that will at least indicate a spirit of fairness regardless of one's prejudices. From this unfair treatment the sheepmen of this country have suffered many losses.

Cattlemen also were becoming aroused by the departmental rulings and there was constant agitation for a cattle-growers' association, through which the industry

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32. Potter, A. F., "Grazing and Water Storage on Black Mesa Forest Reserve," Forestry and Irrigation, Vol. 8 (1902) p. 236.

33. Southwestern Stockman, Farmer and Feeder, Editorial, February 21, 1902.

34. Op. Cit., Editorial, April 24, 1903.

might deal with the department in questions involving their rights to the use of the forest ranges. The columns of the Stockman<sup>35</sup> carried this editorial statement with reference to the matter on May 29, 1903:

.... When this condition of affairs exists (i. e. existence of a responsible cattle-growers association) it is reasonable to believe that they will have some voice at least in the affairs which concern them and the industry which they represent. It is hardly fair to say that they enjoy this privilege now ... that such men should be regarded with suspicion day and night, and shadowed in their every movement is not in line even with common decency, and our guess is that they will not abide by such treatment very long when they have it in their power to throw overboard such poppy-cock and demand to be treated as responsible men, rather than like school children in pinafores. The unenviable position of the black man in the South cannot be compared with this ....

Even the lawlessness of the ranges was blamed upon the new and irksome restriction of individual freedom. This same publication carried an editorial on July 31, 1903<sup>36</sup> which charged that:

.... very largely due to the forest reserve law which has taken the use of a very large slice of the best range lands of the west away from the stockman, we are forced to read of the lawlessness which is rampant on the ranges, not only in Wyoming, but extending into Montana and Oregon .... It is an old subject and has but one solution. The Federal Government must make some move looking to

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35. Southwestern Stockman, Farmer and Feeder, May 29, 1903. Editorial.

36. Southwestern Stockman, Farmer and Feeder, July 31, 1903. Editorial.

this end, and it should be done soon. It is one of the great problems that we believe can be solved through the great national associations representing both classes of stock raisers ... a joint delegation of cattlemen and sheepmen with ample funds at their command for needed expenses to carry the matter before Congress and never cease in the effort until the controversy is ended by a proper disposition of the grazing privilege of the public domain. (i.e., private ownership.)

#### Questionnaire to Arizona Stockmen, 1905

In 1905 the Public Lands Commission, appointed by President Roosevelt to study the application and effects of the various public land laws and the problems arising therefrom, published its report. The study of the grazing problem made by this Commission was intended to show whether the range lands in the public ownership were being used in the best way possible for the continued development of the country, or whether they were being abused under a system which was detrimental to such development, and by which the value of the land was being destroyed.<sup>37</sup>

As one method of determining these facts, the Commission had sent out a questionnaire to over 1,500 representative stockmen in the western states. Seventy-four replies were received from Arizona stockmen; their reactions to the

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37. U. S. Senate Document No. 189, Vol. 4, 58th Congress, 3rd Session.

questions are shown below:<sup>38</sup>

To the question "how does the grass and other stock feed on your range at the present time compare with former years," one-third of the stockmen reported the grass as being better than usual, while at the same time only one-ninth of the group reported the general carrying capacity of their ranges as having increased.

To the question "if it has diminished, to what extent has this been due to overstocking, or to the manner in which stock has been handled," a little more than half the number reported that the depletion was due to overstocking, and to drought. One-fifth of those reporting blamed the depletion upon sheep grazing.

In the opinion of two-fifths of the men reporting, the most practical method for the proper control and permanent improvement of the public grazing lands was to let them pass into individual ownership, while an additional one-third believed that community divisions would serve the purpose.

There are other reports of range conditions which serve to verify the accuracy of the replies to this questionnaire. In 1901 it was reported by a competent authority that sheep grazing on the southwestern forest

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38. U. S. Forest Service Bulletin No. 62, Grazing on the Public Lands, p. 12-14.

reservations, notably in Arizona, had been carried so far that natural reproduction was at a standstill, and the forest floor in some places had been made almost as bare and compact as a road bed.<sup>39</sup>

In 1903 the United States Geological Survey reported that on the Black Mesa reserve, the entire area of which constituted a natural range, grazing had suffered greatly owing to continued drought and that the only remaining areas which were used solely for cattle range were on the Blue and Salt Rivers, and Eagle Creek. The Double Circle cattle ranch, which had once grazed over 100,000 head of cattle on this land had been compelled gradually to decrease its herd until, in that year, it numbered not more than 9,000.<sup>40</sup>

A little later it was reported that near Winslow, Arizona, there were hundreds of acres of once thoroughly sodded meadow land which the winds had swept clean of soil, only the sand rock and an occasional hummock remaining. This was the result of overgrazing. Other localities were subject to the wash of flood waters.<sup>41</sup> (See Figure 10.)

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39. Toumey, J.W., President of Yale School of Forestry, "Our Forest Reservations," Popular Science, Vol. 59 (1901) p. 128.

40. Forestry Conditions in Black Mesa Forest Reserve, Arizona, U. S. Geological Survey, Professional Paper No. 23, Series H, Forestry 8.

41. Holsinger, S.J., "The Boundary Line Between the Desert and the Forest," Forestry and Irrigation, Vol. 8 (1902) p.25.

### Results of Land Use, 1862-1905

The story of the exploitation of the grass lands of the west during the period from 1862 to 1905, when the administration of the forests was transferred to the foresters in the Department of Agriculture, is but a repetition of the story of forest and mineral exploitation during the same period. The legend of the inexhaustibility of natural resources, and of the right of the individual to use them in any way he saw fit, unchecked by any authority of government, had done its work. The land policies of the period, based, as we have seen, upon a desire "to promote settlement" had resulted in speculative exploitation for immediate profit which had gone on without serious interference from the Department of the Interior. When the policy of "conservation of resources" was adopted, those who administered it found themselves faced with serious problems which were the direct result of the earlier legislation for use of the public lands. The problems faced by the conservationists on the grass lands were those of heavy overstocking, ruthless competition, soil erosion serious enough to threaten the watersheds of various irrigation projects, and rugged individualism which would go to almost any length to protect itself.

## CHAPTER X

### MANAGEMENT OF GRAZING LANDS ON THE FORESTS OF ARIZONA Part II. 1905-1936

#### Regulation of Range Use by Department of Agriculture for Lands on the National Forests

In 1905 the administration of the forest reservations was transferred from the jurisdiction of the Department of the Interior to that of the Department of Agriculture. This transfer marked the inauguration of a new policy for handling natural resources. "Conservation for use" became the objective, rather than "free use to promote settlement." The Department of Agriculture, through the new Bureau of Forestry, began at once to carry on a campaign intended to conserve, and to improve without undue delay, all the natural resources found on the reserved lands, so that the industries dependent thereon might be stabilized, and future generations assured of the enjoyment of similar privileges. Carrying out these new policies meant overcoming the opposition of the individualists who insisted on the existence of an "implied contract on the part of the government to permit free use of the public lands by settlers." Gifford Pinchot, the chief of the new bureau, had previously made studies of the western range and forest problems, and was aware of the gravity of the situation on the western ranges. A program of strict control was begun almost at once. It

was announced that, after July 1, 1905, all grazers on the reserved lands would be expected to secure licenses for such use, and would be charged a small fee for the permits. In Arizona this amounted to six cents a head for cattle.

As soon as the new regulation was published, opposition was aroused. It was charged that the cattle business would be ruined, although what irked stockmen most was the principle of the thing - the idea of being made to pay even a single penny for the use of what was theirs by right of conquest and possession.<sup>1</sup> After the first storm of protest had spent itself, however, the fees were paid without much friction, thanks in part to the appointment of advisory boards by the local associations of stockmen on invitation of the Forest Service,<sup>2</sup> and in part to the administration of the grazing regulations by Albert F. Potter, himself a cattleman known and respected by all the stockmen in Arizona and the west, because he "knew their language and their troubles, knew the smell of corral dust, and the taste of sheep dip, the difference between a bed ground and a lambing ground."<sup>3</sup>

#### Results of Controlled Use

In 1907 the Arizona Cattle Growers' Association

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1. Barnes, W.C., "Winning the Forest Range," American Forests and Forest Life, Vol. 36, p.398-8 (1930); Southwestern Stockman, Farmer and Feeder, Editorials, Sept. 29 and Oct. 6, 1905.
  2. U.S.D.A. Annual Report of Forester, 1906, p.267; Southwestern Stockman, Farmer and Feeder, Jan. 5 and June 8, 1906.
  3. Barnes, op. cit., p. 399.

pioneered among other western cattlemen's associations in offering a resolution favoring the supervision and regulation of the public grazing lands within the territory by the Federal Government. These resolutions came as a result of the good work done by the Forest Service, for on the leased ranges in the reserves where overstocking was not permitted, cattle were already paying bigger returns and were more easily handled.<sup>4</sup>

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4. Hall, Sharlot M., "Old Range Days and New in Arizona," Out West Magazine Vol. 28, (1908) p. 195-196. Full text of resolutions follows:

We, the members of the Arizona Cattle Grower's Association, favor a supervision and regulation of the public grazing lands within this territory by the Federal Government through some system which would operate in an equitable, just, and proper manner to all occupants of the range, and which would not interfere with homestead entry at set periods.

We suggest that a fair and just regulation of these public lands can be accomplished by leasing upon a per capital basis, and in the event this method is determined upon, we favor the issuance of leases for periods of not more than ten years.

We believe that under any system of governmental control of the range, the rights of the present occupants of the grazing area, as determined by priority of occupancy and use, should be carefully safeguarded; and we urge that in the enactment of such a law for control of grazing lands it be provided that no provision of such law shall in any way interfere with the sanitary livestock laws of this territory.

Such a supervision and regulation can only be accomplished by the enactment of the proper Federal laws, and we earnestly request Congress to enact such laws.

We deplore the devastation caused throughout the northern part of the territory by migratory sheep herds, and we look to Federal control of the public grazing lands to prevent this unfair use of Arizona's grazing lands.

In 1909 the editorial columns of the Southwestern Stockman, Farmer and Feeder carried a statement that "much of the grazing land included in the national forests was comparatively unproductive as a result of unrestricted grazing before it came under forest service control. Since that time it is estimated that the efficiency of these lands has been increased 30% merely by the prevention of misuse ...!"<sup>5</sup>

In that same year (1909) it was found that sheep grazing on certain parts of the Salt River watershed, lying within the Tonto National Forest, was injurious to the interests of the Salt River Reclamation project, and accordingly the Forest Service, after fair notice to the stockmen who had been using the range, closed the area to sheep. This, together with stringent rulings made for other western states brought a great storm of criticism from the stockmen's associations of the region.<sup>6</sup>

The ruling of the department, providing free grazing in the forests for the milch cows, horses, and work animals of settlers in and near the forests, also aroused resentment among the larger stock growers who begrudged the forage the animals consumed.

The reply of Gifford Pinchot to criticism of the Service on these points appeared in the columns of the

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5. Southwestern Stockman, Farmer and Feeder, March 5, 1909.  
6. U. S. D. A. Report of the Secretary, 1909, p. 91.

Southwestern Stockman. In essence he said:<sup>7</sup>

... in the exercise of the duty imposed upon it, the Service has time and again prevented certain men or certain interests from getting things they wanted, but ought not to have, and from these men and these interests the bitterest and most persistent part of the opposition has steadily come. Such interests are found, for example, in some of the great sheepmen who object to making room for the small settler, or to such reduction in the number of their stock as is necessary to protect the irrigation interests and from men who are engaged in the formation of a great power trust. For the opposition it has excited from these interests, the Forest Service has no apologies whatever to make.

#### Extension of Management

After five years of conservative management, the objective of which had been chiefly the prevention of misuse while studies were made of possible methods of improvement, the department decided to extend its control. The new objectives were; first, the protection and conservative use of the range itself; second, the promotion of the best permanent welfare of the livestock industry; and third, protection of the settler and home builder against unfair competition in the use of the range.

That the stockmen in Arizona were, in general, favorable to the extension of control for the attainment of these objectives may be assumed from the editorial comment made

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7. Southwestern Stockman, Farmer and Feeder, March 19, 1909, Address of Gifford Pinchot to National Live Stock Association.

by the Stockman in 1913, when there was a strong movement on foot to place the national forests under the control of the various states in which they were located.<sup>8</sup> Said the editor:

... We can conceive of no plan that would embody destructive statesmanship more than this. As a business proposition ... decentralization of control of the immense timber and grazing wealth of the country would almost certainly result in decreased returns and increased costs, from these resources ....

Under State control, the political feature would soon cause dissatisfaction and each succeeding state administration would have new ideas and new men to try out .... Turn the forests over to the individual states and the present feeling of security and permanency will disappear ... the movement is fathered by the big timber and land grabbers.

This shows a complete reversal of editorial opinion in the course of six years, and could have resulted only from a generally gratifying experience.<sup>9</sup>

The principle of cooperative control which had been begun back in 1901 was, in 1913, extended to "give settlers and local users more voice in national forest administration." Questions which involved the public interests of such users were to be considered jointly by advisory boards representing the groups and the Forest Service, just as

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8. Southwestern Stockman, Farmer and Feeder, Editorial March 15, 1913.

9. Compare the comment cited from this publication under date of July 31, 1903 and Sept. 29 and Oct. 6, 1905 with that cited under date of March 15, 1913.

they were considered jointly by the Service and the stockmen's advisory committees. It was hoped to make "home participation in national forest management" a reality, and thus to prevent the development of opposition.<sup>10</sup>

All such measures were heartily welcomed by the citizens of the state. A feeling of confidence on the part of the public in the just administration of the forests seemed to be developing rather rapidly.

In 1914, at the annual convention of the Arizona Cattle Growers' Association, resolutions on national forest range administration were passed. These resolutions advocated keeping the national forests intact, and complimented the forest officials for the manner in which they had managed their various sections. In addition to these resolutions dealing with the national forest administration, another was passed which dealt with the extension of a similar system of control to the other public ranges. The regulation so greatly feared in other years had now become a welcome thing.<sup>11</sup> The same group which had earlier sought its relaxation, now favored its extension as a means of assuring the stability of their industry.<sup>12</sup>

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10. Southwestern Stockman, Farmer and Feeder, Aug. 1, 1913.

11. Hall, op. cit., p. 195-196. Full text of the resolutions is not given by this author, and could not be obtained from the Association.

12. Southwestern Stockman, Farmer and Feeder, Jan. 9, 1914, p. 7.

From 1905 to 1917 the grazing privileges on the forests became steadily more valuable for many causes. Chief among these was the growing scarcity of free range, and the higher price of meat. The prices received for grazing on Indian lands, state, private, and railroad lands, rose accordingly--the fees charged on national forests remained stationary. Finally the service gave notice of an increase which, in three years, would have doubled the scale of charges. The various livestock associations uniformly protested against this increase in the established rates. A pamphlet issued at this time by an Arizona stockman is quoted in the American Forestry magazine editorial columns.<sup>13</sup>

Said this frank individual:

... The Forest Service have promulgated and have now in force a regulated system of grazing on their forests of which they may justly be proud, covering an almost unbelievable range of conditions as wide as this great country itself .... The stockmen do not fear, but favor, the regulation of their business, based upon fairness and the greatest good to the greatest number ... but they quite naturally desire to secure these privileges at as low a cost as possible, and if protests will accomplish this, they are going to protest.

The protests were successful, and coupled with the emergency needs of the war market, served to delay the action of the department.

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13. American Forestry, Editorial, Vol. 23, p. 177 (1917).

### Post-war Opposition, 1920-36

The department would doubtless have renewed the attempt to increase its charges had not the post-war slump in the cattle industry given rise to a strong tendency not only to kill any legislation for the regulation of ranges on the public lands (during the period we have reviewed there had been a constant procession of bills in Congress, all looking to one form of control or another for the ranges on the public domain. All of these bills had been bitterly and successfully opposed by the stockmen),<sup>14</sup> but also to kill any further plans of the department for extension of control over the forest ranges. Matters went so far as to result in an attempt to discredit, and secure the discard of, the regulations then in force.

#### Controversy over Fee Basis

About 1924 a controversy was precipitated by the proposal of the Forest Service to appraise the forage crop on the basis of its market value, just as timber was appraised and sold. The existing fees were 50% below the prices which owners of comparable ranges were charging. The cattlemen alleged that the Service had no right to change the basis of its charges from "cost of administration" to "market value."

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14. A history of these legislative proposals for range control is given by Will C. Barnes, in Story of the Range, op. cit., p. 53-55.

Their demands, if granted, would have reduced the fees by two-thirds, rather than increased them by one-half. The issue involved was the justice of giving with one hand, to a special class of forest-users (stockmen) forage worth millions of dollars at the mere cost of giving, when, with the other hand, timbermen were denied that privilege, and held to the full commercial value of the timber. Both groups commercialized their product to their own profit. Both, said the department, should receive the same treatment.

Politics ran all through the agitation, since men who were candidates for public office would have been less than human if they had not taken advantage of issues which existed in their states.

#### Public Lands Commission Report of 1925

In 1925 a sub-committee of the Public Lands Commission made an investigation of the grazing practices on the national forests. The members of the sub-committee were Senators Stanfield of Oregon, Cameron of Arizona, and Oddie of Nevada. They were all Republicans, all candidates for re-election, and all encountering difficulty in accomplishing their ambitions. The political importance which both Senator Stanfield and Senator Cameron placed upon their championship of the stockmen was indicated by the fact that while a few hearings were held in most of the western states,

the bulk of them were held in Arizona and Oregon, respectively.<sup>15</sup>

The manner in which hearings were held in Arizona occasioned considerable criticism at the time. The hearings were held late in June, 1925, in the name of the Committee, but only Senators Cameron and Ashurst were present. (Senator Ashurst was not originally on the committee, but was appointed prior to the Arizona hearings.)

The re-election of Senator Cameron was to come before the state in the fall. The hearings covered the state, being held at Douglas, Tucson, Globe, Prescott, Flagstaff, Phoenix, Florence, Grand Canyon, Holbrook, St. Johns and Springerville. The number of hearings held in Arizona was more than five times the number planned for any other western state except Oregon, and gave rise to the criticism that the senators used the committee pretext in order to tour their state and repair their political fences. At these hearings Senator Cameron openly attacked the Forest Service, and in this he was ably assisted by Senator Ashurst.<sup>16</sup>

The published reports of the hearings which the Public Lands Commission held in Washington and in Arizona seemed

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15. Authier, George, "Both Sides of the Range Controversy," American Forests and Forest Life. Vol. 31, p. 715, (1925).

16. Butler, Ovid, "Shall the Stockmen Control the National Forests," American Forests and Forest Life, Vol. 31, p. 574, (1925).

to reflect not primarily an interest on the part of the committee in getting at the crux of the grazing situation - its effect upon watersheds and forest conditions - but rather an attempt to elicit from its witnesses, by leading questions, superficial criticisms of public officials who were endeavoring to carry out the grazing policies of the government.<sup>17</sup>

The desires of the stockmen whose votes the four senators hoped to secure were embodied in the measure, known as the Stanfield Bill (Senate 2584). This bill sought to change the grazing administration of the National forests in several radical ways. First of all, it would have given the industry vested rights on the forests, so elaborately protected against administrative regulation as to make them virtually perpetual. In effect, this would have reversed the conservation policy of the government, and have given a large grant of public resources to the livestock interests who used the national forests.<sup>18</sup>

Second, the bill would have established, as a policy of Congress, the more complete development, protection and utilization of the grazing facilities of the national

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17. Editorial, "The Investigation of Uncle Sam's Ranges," American Forests and Forest Life, Vol. 31, p. 611, and U.S. Senate, Committee on Public Lands and Surveys, Hearings on Senate 2584, 69th Congress, 1st Session.

18. U.S. Senate, Ibid., and "Report of Hearings in Committee on the Stanfield Bill," American Forests and Forest Life, Vol. 32, (1926) p. 203.

forests as a primary use of these forests, coordinate with timber production and the protection of water resources.<sup>19</sup>

This would also have been a reversal of established policy.

The battle over this measure was long and hard. The livestock industry was in a serious condition. The cattlemen always, and naturally, looked with hostility upon anything which curtailed or limited their grazing opportunities, and with favor upon anything that would extend them. When there seemed to be some prospect, through Congressional intervention, of forcing the Department of Agriculture and the Forest Service to recognize their grazing permits as property rights, transferable at will, they forgot all the benefits of the departmental regulations, and pressed only toward that end, disregarding the rights of future generations to enjoy the same privileges they were exercising.<sup>20</sup> The issue over the prescriptive right to grazing lands in the national forests on the basis of past use, was the most important. If granted, it would have made some 90,000,000 acres of land in the forests subject to the desires of the grazing industry, and would have set aside the dominant purpose for which the forests had been created.<sup>21</sup>

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19. Editorial, American Forests and Forest Life, Vol.23, p.73.

20. Authier, op. cit., p. 716.

21. Editorial, "The Stockmen and the National Forests," American Forests and Forest Life, Vol.31, p.548 (1925) and "An Abstract of the Casement Report to the Secretary of Agriculture," American Forests and Forest Life, Vol.32, p.734 (1926).

### Attacks on Experimental Work

The vicious attack upon the conservation policies of the government, launched by supporters of the Stanfield Bill, went even farther, and attacked the validity of the experimental work carried on to determine range policies and forest practice.

From the very early years of the service, experimental studies had been carried on in many branches of forestry, and upon the results of such studies the policies of the bureau were based.

The Coconino Experiment Station, later known as the Fort Valley Experiment Station, and now as the Fort Valley branch of the Southwestern Forest and Range Experiment Station, was established January 1, 1909.<sup>22</sup> Range research under the Forest Service was inaugurated on the semi-desert grassland ranges of the Southwest in 1915; in Southern Arizona on the Santa Rita Experimental Range, and in Southern New Mexico on the Jornada Experimental Range. In 1920 this work was extended to shrub ranges of low mountains. In 1927 additional studies were started to cover another principal forage type in the Southwest; namely, that of the cut-over and open virgin Ponderosa pine stands on the

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22. Pearson, G. A., "The Oldest Forest Experiment Station," a mimeographed article from the Southwestern Forest and Range Experiment Station, 1936.

Colorado Plateau in Arizona.

Range research by the Southwestern Forest and Range Experiment Station comprises a number of specific projects under the broad divisions of management of range resources; management of domestic livestock; management of wildlife; and forest and range influences. The basic aims of this research have been (1) to develop methods for the management of the range itself that will insure a sustained yield of forage for the production of livestock; (2) to develop methods for the management of livestock on the range to insure sufficient annual returns to put the range industry on a stable basis; and (3) so to modify the resulting methods of management of both range and livestock as to serve the maximum proper use of the other forest and range resources, including soil, water, timber, wildlife investigations, and recreational facilities.<sup>23</sup>

In the early months of 1926 the Southwestern Forest and Range Experiment Station published its report concerning damage done to young trees by livestock.<sup>24</sup> The facts were the final conclusions of one of the most thorough and painstaking investigations ever conducted by the staff of the Forest Service. (See Figures 11 and 12.)

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23. Southwestern Forest and Range Experiment Station, Annual Report on Progress in Research, 1935, p. 37. Mimeographed, not for publication.

24. U.S.D.A. Yearbook, 1926, p. 386-388.

The stockmen branded these conclusions as "propaganda against sheep grazing in the national forests which shows bias and a malicious attempt to create a wrong impression in the public mind." The Arizona Woolgrowers' Association, in January, 1926 adopted a resolution asking the Chief Forester to prevent a "recurrence of such articles from the pens of members of the Forest Service."<sup>25</sup> They wished to suppress the results of any scientific research which was at variance with their private interests. "The stockmen," said Professor H. H. Chapman, of the School of Forestry at Yale University, "are making one of the boldest and least defensible raids on public welfare which has yet been attempted."<sup>26</sup> Confronted with the proof of the facts which they denied, these men resorted to political pressure to throttle and muzzle the scientists employed to determine these facts, and to prevent the public from obtaining this information.

The Stanfield Bill was defeated, but from the long fight there has grown opposition so bitter that it threatens the integrity of the national forests themselves.<sup>27</sup>

The position of the Department of Agriculture, with

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25. Editorial, American Forests and Forest Life, Vol. 32, (1926) p. 167.

26. Ibid.

27. "The Grazing Issue Again," American Forests, Vol. 39 (1932) p. 62, and U. S. Senate Document No. 199, 74th Congress, 2d. Session, "The Western Range," (1936) p. 3.

regard to its program of increased grazing fees on the forests (the original cause of the controversy had been the proposal to change the basis for assessing fees) was outlined by Secretary Jardine in an address before the American National Livestock Association held on January 25, 1927. The Secretary said that there would be no change in grazing fees during that calendar year; that a new schedule of fees would be put into effect on a gradual scale, one-fourth each year from 1928 to 1931; that the Forest Service would make a careful study of the relation of grazing fees to the current market value of livestock products with a view to determining whether such a method of establishing grazing fees should be adopted in subsequent range appraisals; and that the average increase would be about 45%. "The Department ... has no intention of charging full commercial values ... or of getting all the traffic will bear."<sup>28</sup>

#### Opposition During Depression Years, 1929-36

As the economic stress in the period subsequent to 1929 made itself felt, there were frequent demands for reduction in the grazing fees on the forests. In 1931 the sheepmen demanded a reduction of 30% in the grazing fees "in view of the general depression affecting the grazing industry." The

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<sup>28</sup>. "Secretary Jardine Announces a Grazing Decision," American Forests and Forest Life, Vol. 33, p. 147-148 (1927).

fees being charged were still substantially below, and frequently less than half the amounts paid in rentals, taxes, and interest for similar pasturage on private lands. Moreover, only 25% of the producers in the west would have benefited by the reduction and the states' income for schools and roads would have been seriously reduced at a time when resources were already badly depleted. The Secretary refused the request on these grounds but the stockmen, through their congressmen, brought pressure to bear upon the President (through passage of a Senate resolution (No. 151)) and the Secretary was instructed to reverse his decision and reduce the fees 50% for 1932 "in recognition of the emergency situation facing stockmen as a result of last year's drought, the unusually heavy snows, and the prevailing hard winter." The states and counties where national forests were located suffered losses in receipts of 50%, but the select group of stockmen who enjoyed the national forest grazing privilege benefited by it.<sup>29</sup>

This action was, in effect, notice to the Secretary of Agriculture that if he would not grant the stockmen the concessions they demanded, they would go to Congress to get them. Early in 1933 resolutions were pending in both houses of Congress to grant a reduction of 50% in

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29. Editorial, "Grazing Fee Reduction Denied," American Forests, Vol. 37 (1931) p. 686, and Editorial, "Grazing Fees on National Forests Cut," Vol. 38, p. 340 (1932).

fees during 1933. These resolutions failed to pass, and on March 9 of that year, Secretary Wallace announced that the grazing rates would be maintained on the 1931 basis of 14.5¢ for cattle and 4.5¢ for sheep until a thorough study could be made.<sup>30</sup>

The refusal to grant the same reduction of 50% in fees in 1933 that had been given in 1932 carried with it the obligation to survey the problem anew, and to determine upon the most equitable system--one which would recognize market fluctuations. Late in 1933 the new basis was announced. The price received by producers during any one year was to be the index to use in adjustment of fees on national forest ranges in accord with the fluctuations in livestock prices. The plan for adjusting fees was to be applied in a broad way and no attempt was to be made to adjust fees on account of local conditions. The 1931 rate was the base for computing ratios.<sup>31</sup>

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30. Editorial, "Wallace Keeps Present Grazing Rates on the National Forests," American Forests, Vol. 39 (1933) p. 182. U.S. D.A. A National Plan for American Forestry, p. 545 (1933). In 1931 the average fee for cattle was 14.5¢ per head per month and the average fee for sheep was 4.5¢ per head per month.

31. Editorial, "New Plan for Grazing Fees on National Forests," American Forests, Vol. 39 (1933) p. 324.

Shall the Range Occupy a Coordinate Position With  
Timber and Water Resources?

When a review of the course of range management is made, both for the period before it came under the administration of the Department of Agriculture, and after, it can readily be seen that the role of the grazing problem in forest management is most important. Shall it become coordinate, or remain subordinate to the twin objectives of general forest policy? As a threat to this policy, it endangers the integrity of the forest system, since the interests involved are powerful, entrenched in the industrial development of the west, and well organized to secure pressure on political representatives. In this coercion Arizona stockmen may be considered pioneers. If, for example, the Senate and House resolutions of 1933 had passed, it would have confirmed the precedent set in 1931 and would have made the national forest administration merely a game of "to the victor belong the spoils." Not only sheepmen and cowmen, but lumbermen and other users of the national forests might besiege Congress, with fair likelihood of success, for special concessions which would demoralize the administration of the forests in the broad public interest.<sup>32</sup>

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32. Editorial, "The Grazing Issue Again," American Forests, Vol. 39, p. 62 (1933).

## CHAPTER XI

### EVALUATION OF THE USE AND MANAGEMENT OF THE FORESTED LANDS OF ARIZONA

The history of the forest lands of Arizona has been traced from the creation of the territory, and the passage of the first of the Public Land laws to the end of the third decade of management under the Forest Service in the Department of Agriculture. At the opening of the period, free, rugged individualism was the accepted practice in the use of natural resources. At the close of the period, governmental control for the good of society in general, and the practice of limiting the rights of one generation for the benefit of later ones had become general.

The objectives of forest management have been three: conservation and production of timber; protection of watersheds; and, management of forest range lands to prevent the destruction of the forest cover and of seedling trees, thus assuring the attainment of the first two goals of administration.

The development of forest management practice has been traced with reference to each of these objectives.

Lumbermen, whose complaints before the first conservation laws were passed dealt with the fact that there was no legal means of securing timber, or of purchasing timber

lands in large enough units for profitable developments of lumber mills, had, therefore, little complaint to offer when the forest management of the Department of Agriculture was instituted, for early conservation laws and departmental regulations provided a form of commercial sale sufficiently liberal to permit reasonable profits to mill operators, and yet sufficiently competitive to protect the interests of the government.

The regulation of cutting to provide a "crop" was to the mutual advantage of both the lumbermen and the government, for it stabilized the industry and at the same time protected the forests.

Because the new regulations met a real need in a wise and equitable fashion little adverse opinion was expressed by the lumber interests with respect to the timber management of the Forest Service.

The second objective, the protection of watersheds, has been secured through the same type of management which gave success to the third. Range management protects the forest cover, and thus prevents erosion and run-off which deplete the water supplies of the territory.

Range management practice developed slowly, and in the face of constant opposition from the stockmen whose interests were most interfered with. Every regulation has had to prove its value before opposition to it has ceased. Opposition at first was fairly general: the government was

violating an implied contract when it charged fees for the use of the forage resources which had been freely used for so long. The right of the Service to charge for its ranges at commercial rates, as it does for timber, has never been fully asserted, however, because of the determined opposition and congressional lobbying by the stockmen.

The stockmen opposed the regulation of size of herds as an infringement of their individual freedom. They charged that the new rulings would drive the little man out of business, would ruin the industry as a whole, and would favor only the big monopolies. The control of the range, it was argued, would not improve the grass, would not prevent erosion and make fire control easier, would not, in fact, help anyone! Experience gradually demonstrated the fallacy of every one of these contentions. Individual "freedom" is now sought through government regulation. Keeping the other fellow off your range has proved to be more profitable than letting your own cattle run from one range to another in search of grass and water. The little man is still in business. There are no more big range monopolies than there were thirty years ago before regulation was in force (and perhaps not as many). The grass in the forest areas is better than that on most privately owned ranges, and markedly better than that on the open range. Erosion has been controlled and watersheds protected. These are the demonstrable results of range management.

In addition to the general advantages of the conservative management of natural resources for the benefit of future generations, it has been of great benefit to the generations which have witnessed its development. They have seen its results in the stabilization of essential industries, namely, lumbering, stock-farming, and agriculture. It has been demonstrated that these things have been accomplished in Arizona, and that, in addition, the Federal administration of the national forests has been financially advantageous to the state as a whole, through the assurance of income in perpetuity from school lands on the national forests, and of income for the common schools from the sale of forest resources.

The practices of the United States Forest Service, as they have affected the natural resources - timber, grass, and water - have been instrumental in conserving these assets for future needs. The effect of the conservation of these resources upon the chief industries of the state has been to stabilize crop-farming, stock-raising and lumbering, and to assure their permanency. The value of the use and management practices is seen also in the social development they have helped to bring about. The schools of the state have been benefited by wise fiscal policies. Communities have grown as a result of encouragement given to certain types of industries dependent upon forest

products, and the building of communication lines in isolated districts. Recreational values have been fostered. The history of forest management in this state has been a creditable one, when compared with that of many western states, and the opposition of the public to conservation has almost disappeared.

**APPENDICES**

APPENDIX A

AGREEMENT BETWEEN SECRETARY OF THE UNITED STATES DEPARTMENT  
OF AGRICULTURE AND THE STATE LAND COMMISSION OF ARIZONA  
January 1914

This agreement, made this fifteenth day of January, 1914, by and between the Secretary of the United States Department of Agriculture, party of the first part, and the State Land Commission of the State of Arizona, party of the second part,

WITNESSETH, That, whereas there is within the boundaries of the National Forests, in the State of Arizona, a tract of 36,790.14 acres of land acquired by the State of Arizona under the provisions of the Act of Congress of February 18, 1881 (21 Stat., 326), and described as follows:

Township 20 North, Range 5 East:

All of Sections 2, 8, 10, 12, 14, 18, 20, 22, 24, 26, 28, and the  $N\frac{1}{2}$  of 30, the  $E\frac{1}{2}$  of 32, and all of 34.

Township 20 North, Range 6 East:

All of Sections 2 and 4,  $E\frac{1}{2}$  of 8, all of Sections 10, 12, 14, 18, 20, 22, 26, 28, 30, 32, and  $W\frac{1}{2}$  of 34.

Township 20 North, Range 7 East:

All of Sections 6 and 18.

Township 21 North, Range 3 East:

All of Section 2.

Township 21 North, Range 5 East:

All of Sections 12, 14, 18, 20, 22, 24, 26, 28, 30, and  $E\frac{1}{2}$  and  $N.W.\frac{1}{4}$  of 34.

Township 21 North, Range 6 East:

All of Sections 12, 26, 28, 30, and 34.

Township 21 North, Range 7 East:

All of Sections 6, 8, 18, 24, and 26.

Township 21 North, Range 8 East:

All of Sections 2, 4, 8, 10, 18, 20, 22, 28, and 30.

upon which there is, at present, both merchantable and growing timber, and upon which there also grows an annual crop of forage plants and grasses, all of which should be protected and utilized for the benefit of the people of the State, and

WHEREAS, the protection, conservative lumbering and forest management of these said lands is necessary for the proper protection of the National Forests adjacent thereto, and

WHEREAS, the State Legislature of Arizona has passed the following law, "An Act Providing for the Administration and Sale of Timber and Timber Products upon Public Lands of the State":

Sec. 1. In addition to the powers and duties already imposed by law upon the state land commission, it shall be its duty, and the said commission shall have authority to care for, sell, or otherwise administer, the timber and timber products upon the public lands of the state, under such rules and regulations as the commission may prescribe, but in conformity with the provisions of the act of Congress, approved June 20, 1910, otherwise known as the Enabling Act, and other acts of Congress relating to specific grants of land to the Territory, now the State of Arizona, also in conformity with the provisions of the state constitution relating to state and school lands; said rules and regulations shall also conform, as nearly as may be, with the rules and regulations of the forestry department of the United States; provided, that no contract for the sale of timber shall exceed three years in term, nor shall more than fifteen million feet of standing timber be sold to any one person, firm, company, or corporation, while such person, firm, company

or corporation has under sale or contract more than one million feet of standing timber sold under the provisions of this section.

Sec. 2. This act shall be considered as cumulative to other acts relating to the duties and powers of the state land commission.

AND, WHEREAS, the party of the second part is desirous of disposing of the merchantable timber on its lands within the Coconino and Tusayan National Forests in accordance with the methods and practice of the Forest Service.

I

NOW, THEREFORE, the party of the first part for the considerations hereinafter mentioned agrees to and with the party of the second part as follows:

(1) To furnish to the party of the second part the rules and regulations promulgated by the Secretary of Agriculture for the administration and use of the National Forest lands.

(2) To furnish to the party of the second part a copy of the Forest Service fire plans which have been adopted for use on National Forest lands which are adjacent to State lands covered by this agreement.

(3) To advise the party of the second part of the policies and methods which are used by the Forest Service in timber sale operations.

(4) To advise the party of the second part as to the proper care of the said state lands.

(5) To furnish the party of the second part with forms

of Forest Service timber sale contracts.

(6) To examine the said State lands when requested by the party of the second part, and to report upon the condition and status of the lands and the products thereof, the desirability of timber sales, logging plans, stumpage values, and such other similar advisory matters as would aid in the proper administration of the lands and the disposition of the products; such examinations and reports to be made without cost to the party of the second part.

(7) To designate, upon request of the party of the second part, Forest officers who may work for the State in the working, scaling, supervision of logging and other operations in connection with the removal of the timber from the said State lands, provided the salaries and expenses of the Forest officers while engaged in such work shall be borne by the State.

## II

The party of the second part on condition that the party of the first part perform the provisions herein agrees to and with the party of the first part, as follows:

(1) To employ during the fire season (usually from May 1 to October 31, but to be specifically determined in each year by fifteen (15) days' advance notice from the party of the first part to the party of the second part) at least one forest guard who shall be instructed to

cooperate fully with local Forest officers.

(2) To pay upon certification by the local Forest officers all expenses resulting (a) from the suppression of fires originating on and confined to the said State lands, irrespective of whether the said fires threaten to spread to adjacent National Forest lands, it being understood that the party of the first part will pay all expenses resulting (b) from the suppression of fires originating on and confined to the National Forest lands, irrespective of whether the said fires threaten to spread to adjacent State lands; to pay upon certification by the local Forest officers all expenses resulting (c) from the suppression of fires on State lands when such fires spread over both State and National Forest lands, it being understood that the party of the first part will pay all expenses resulting (d) from the suppression of fires on National Forest lands when such fires spread over both State and National Forest lands.

(3) To cut and remove the timber from the said State lands as nearly as may be in accordance with National Forest rules and regulations, and the advice given by the party of the first part.

(4) To consult with the party of the first part before making any contract for the removal of the timber from the said State lands.

(5) To conduct all negotiations for the sale of the timber from the said lands.

The parties hereto further mutually agree:

(1) That in the event it should become advantageous for the party of the second part to engage an employe or employes of the United States Forest Service for administrative or supervisory work, as distinguished from advisory field or office work on the said State lands, the party of the second part, upon certification by the District Forester of the time such employe or employes were engaged upon the said State lands will pay to the said employe or employes for the time they were actually so engaged, a compensation equal to the compensation (together with expenses) the said employe or employes were receiving from the United States Forest Service immediately preceding the date they became engaged in the work on the said State lands.

(2) That this agreement may be terminated at the close of any fiscal year, by either party, upon ninety days' notice in writing, to the other party.

(3) No member of, or Delegate to Congress, or Resident Commissioner, after his election or appointment, and either before or after he has qualified, and during his continuance in office, shall be admitted to any share or part of this contract or agreement, or to any benefit to arise therefrom. (Section 3741, Revised Statutes)

IN WITNESS WHEREOF, the parties hereto have executed this instrument in duplicate on the day and year first

above written.

(Signed) B. T. Galloway  
Acting Secretary of the United States  
Department of Agriculture

SEAL

STATE LAND COMMISSION,  
By (Signed) MULFORD WINSOR  
Chairman  
(Signed) C. Y. Byrne  
(Signed) Wm. A. Moody  
Members

Copy of Agreement furnished by the office of Regional  
Forester, Albuquerque, New Mexico

## APPENDIX B

### PUBLIC LAND CODE OF ARIZONA, LAWS OF SECOND SPECIAL SESSION SECOND STATE LEGISLATURE 1915

#### Section 48 (p. 21)

"Upon receipt of the application provided for in section 47, the commissioner shall, under such rules and regulations as the department may adopt, and not contrary to the provisions of this act, cause such lands to be sold; provided, said lands are not such as are prohibited by law to be sold; and provided that no lands containing timber of such value that it should in the opinion of the commissioner be sold separately from the said land, shall not be subject to sale until after said timber shall be sold, and no lands chiefly valuable for the production of saw timber shall be subject to any of the provisions of this act relating to the sale of state lands."

#### Section 76 (p. 30) Division: Products of Land

"Rules and Regulations: Except as otherwise herein provided said rules and regulations for the care, sale, and administration of said timber and timber products shall conform as nearly as may be to the rules and regulations of the forest service of the United States Department of Agriculture."

#### Section 77 (p. 30)

"Limitation of Timber Contracts. No contract for the sale of timber shall exceed five years in term, nor shall more than 50 million feet of timber be sold to any one individual association or corporation, at one sale, nor shall any sale be made or contract entered into with any person, association or corporation, while such individual association or corporation has under sale or contract more than five million feet of timber sold under the provision of this Act."

#### Section 78 (p. 30)

"University Timber Account Fund: The expenses incurred by the commissioner for the care, sale, and other administration of timber or timber products, upon lands granted for university purposes, shall be kept by the commissioner in a separate account and said expenses shall be a charge against said University fund."

Section 81

"Trespass on State Lands: Definition and Punishment.

Whoever knowingly and willfully commits a trespass upon state lands, either by cutting down or destroying any timber or wood standing or growing thereon, or by carrying away any timber or wood therefrom (or by mowing, or cutting, or removing any hay, or grass thereon or therefrom, or by extracting or removing any oils, gases, coal minerals, fertilizer or fossils of any name, kind or description thereon or therefrom, or who, without right, injures or removes any building, fence, improvements, or other property belonging or appertaining to said lands, or unlawfully occupies, plows, or cultivates any of said lands) or negligently or willfully exposes growing trees, shrubs, or undergrowth standing on the state lands to danger or destruction by fire or aids or abets any such trespass or other injury shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than \$50 or more than \$300 or punished by imprisonment in the county jail not more than six months, or by both such fine and imprisonment, provided that this section shall not be construed to prohibit the grazing of livestock upon unfenced or open lands."

APPENDIX C

INDIVIDUAL FIRE REPORT  
SABINO CANYON FIRE  
June 11-15, 1936

(P) AREA BURNED—ACRES—TYPES—DAMAGE

(For CLASS B fires. Show only one timber type and make entries only in blocks A, B, C, D, if applicable, and in column (7). Use ocular estimates and omit the map unless high values are involved)

(Follow instructions below for each column—entries should be to nearest whole dollar or whole acre)

FIRE STARTED IN GR-DR TYPE (Supervisor will enter the "Rating," "Zone," and "Value" figures) FUEL STARTED IN GRASS (Green forest; outcrop; old burn single-double; brush; grass; other)

Table with columns: MAJOR TIMBER TYPE, A TOTAL AREA (acres), B NONPRODUCTIVE FOREST OR AREA, C MATURE OR MERCHANTABLE, D REPRODUCTION OR YOUNG GROWTH. Includes rows for National Forest, Total net N.F., and Grand total.

(P)—Continued. (Note that all figures in parenthesis are triplications. See instructions below)

Table with columns: MAJOR TIMBER TYPE, E CUT-OVER, F MISCELLANEOUS AREAS, G LIVESTOCK FORAGE. Includes rows for National Forest, Total net N.F., and Grand total.

(8) Improvements and other values, \$... (9) Recreation values, \$... (10) Game values, \$... (11) Grand total values, \$715.00

† If only one type is involved, the figures need not be carried down and repeated in the total columns 12, 13, 14, and 17.

(Q) SUPPRESSION COSTS (See instructions)

Table with columns: DIRECT COSTS FROM FOREST SERVICE AND DEPOSITED OR OBLIGATED COOPERATIVE FUNDS, COSTS NOT PAID FROM FOREST SERVICE, OBLIGATED OR DEPOSITED COOPERATIVE FUNDS. Includes items like Labor, Subsistence supplies, and Forest Officers' Time.

(R) ANALYSIS OF ACTION TAKEN, ETC.—Continued

Table with columns: H. CONTROL (Special equipment used, Back pack pump, Tank truck, Horse and plow, Tractor, Power pump, Other Swatters, Successful, Used for original attack, Mop up shovels & axes), I. SPEED OF LINE CONSTRUCTION (Narrower line, Use of horse and plow, Use of power equipment, More bosses, More felling and cutting tools available, Burning out line as rapidly as constructed, Minimizing man power on patrol, Length of road, trail, driveway, etc., used as held fire line, Were any of these available and not used?, Why?, Better detailed location of line, Less width in clearing trees and brush for the control line, Use of lights to facilitate night work, Other).

EXAMINED AND APPROVED Date July 17, 1936 S.A. Sowell, Jr. RST, Supervisor. Is this fire being reported to the State by any other agency? No

(Detach when report is completed) INSTRUCTIONS AND EXPLANATORY NOTES (BY COLUMN DESIGNATIONS) (P) AREA BURNED, etc. Actually measure all fires—estimates of area will not do. For non-National Forest lands damage estimates will be the best obtainable without making extended examinations.

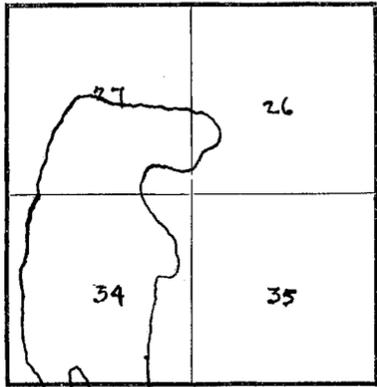
STANDARD FIRE DAMAGE TIMBER TYPES AND SYMBOLS. Table with columns: REGION 1, REGION 2, REGION 3, REGION 4, REGION 5, REGION 6, REGION 7, REGION 8, REGION 9. Includes types like Nonnatural vegetation, Grass, Brush, Woodland, Yellow pine, White pine, Lodgepole, Douglas fir, White fir, Spruce, Larch-Fir, Hemlock, Subalpine.

Forest Coronado  
Ranger Dist. Catalina  
County Pima  
T. 12 S R. 15 E Sec. 34 35 Mer.

# INDIVIDUAL FIRE REPORT

Name of fire Sabino  
Date 6-11 1936  
(Fire started)

"B" AND "C" FIRES  
(Read instructions below with care before preparing report)



Scale 1" or 2" = 1 mile (indicate which).  
\* If caused by fuel sparks, give measured distance from point of origin to center of track in feet.

State Arizona Reportable fire  Nonreportable fire   
CAUSE OF FIRE (Check one)  
Lightning \_\_\_\_\_  
Railroad (not lumbering) { Fuel sparks\* \_\_\_\_\_  
Other \_\_\_\_\_  
Lumbering { Donkeys \_\_\_\_\_  
Railroads, loaders \_\_\_\_\_  
Friction \_\_\_\_\_  
Slash burning \_\_\_\_\_  
Other \_\_\_\_\_  
Campfire   
Smokers \_\_\_\_\_  
Debris burning \_\_\_\_\_  
Incendiary \_\_\_\_\_  
Miscellaneous { Burning building \_\_\_\_\_  
Power lines \_\_\_\_\_  
Automotive equipment \_\_\_\_\_  
Other \_\_\_\_\_

POINT OF ORIGIN (Check one)  
a. On N. F. lands \_\_\_\_\_  
b. On other lands inside N. F. \_\_\_\_\_  
c. On protected lands outside N. F. \_\_\_\_\_  
d. On unprotected lands outside N. F. \_\_\_\_\_  
e. Started outside and entered N. F. protection unit (Yes or No) \_\_\_\_\_  
f. Fought by the F. S. outside the N. F. protection unit, and kept from entering it (Yes or No) \_\_\_\_\_

CHARACTER (Check one)  
Surface fire \_\_\_\_\_  
Duff or ground fire \_\_\_\_\_  
Crown fire \_\_\_\_\_

CLASSIFICATION (Check one)  
B. (Over 1/4 A. - less than 10 A.) \_\_\_\_\_  
C. (10 acres or over) \_\_\_\_\_

ACTION TAKEN (Fill in all spaces)

| Date | TIME RECORD      | ELAPSED TIME RECORD                               |
|------|------------------|---|
| 193  | Hour A. M. P. M. | Hour Min. Instructions                            |
|      |                  | XX XX XX XX XX XX                                 |
|      |                  | Discovery Time (difference between 1 and 2)       |
|      |                  | XX XX XX XX                                       |
|      |                  | XX XX XX XX                                       |
|      |                  | Report Time (difference between 2 and 5)          |
|      |                  | Get-away Time (difference between 5 and 6)        |
|      |                  | Travel Time (difference between 6 and 7)          |
|      |                  | XX XX XX XX XX XX                                 |
|      |                  | Difference between 1 and 7                        |
|      |                  | XX XX XX XX                                       |
|      |                  | Difference between 2 and 7                        |
|      |                  | Start to first work (difference between 1 and 11) |
|      |                  | Difference between 2 and 12                       |
|      |                  | Corral Time (difference between 7 and 13)         |
|      |                  | Control Time (difference between 7 and 14)        |
|      |                  | Difference between 14 and 15                      |

16. Probable area when discovered 50 Area when reached 100 Final area 715 Maximum number men engaged at one time 4 355  
17. Approximate number of man-hours (exclusive of travel time): To corral 3066 Mop up and patrol 11263 Total 15329  
18. Approximate length of line actually built to corral 280 Approximate length of control line lost 120 Perimeter of fire when reached 160 When corralled 340 When controlled 340  
19. Number of chains of fire line built per man-hour up to time of corraling 0 chains. (Exclude primary travel time. Include all men on the fire—laborers, cooks, F. O.'s, etc.)

LAW ENFORCEMENT RECORD  
Fire actionable  Nonactionable \_\_\_\_\_  
Individuals responsible: Known \_\_\_\_\_ Suspected  \_\_\_\_\_  
Name and address Boy Scouts of Tucson  
Criminal case: Won \_\_\_\_\_ Lost \_\_\_\_\_ Pending \_\_\_\_\_  
Civil case: Won \_\_\_\_\_ Lost \_\_\_\_\_ Pending \_\_\_\_\_  
Settled out of court \_\_\_\_\_  
Amount collected: Fines, \$ \_\_\_\_\_ Damages, \$ \_\_\_\_\_

(R) ANALYSIS OF ACTION TAKEN, ETC.  
A. REASON FOR EXTRA PERIOD FIRES (fires not corralled and held before the heat of day following discovery or following the day of invasion from "outside"). Be ultra-critical; assign to one of following "reasons," if practicable:  
1. Lookouts spread too thinly \_\_\_\_\_ 2. Other fire personnel spread too thinly \_\_\_\_\_ 3. Detection failure due to smoke or fog \_\_\_\_\_ 4. Out of season, guards off \_\_\_\_\_  
5. Failure of U. S. F. S. personnel (year long) \_\_\_\_\_ 6. Failure of U. S. F. S. personnel (guards) \_\_\_\_\_ 7. Failure of cooperator (F. S. prot. area only) \_\_\_\_\_ 8. Failure to recognize emergency conditions \_\_\_\_\_ 9. Failure to handle removable special danger \_\_\_\_\_ 10. Failure to use speediest methods \_\_\_\_\_ or 11. Equipment in line construction \_\_\_\_\_ 12. Inadequate planning of attack \_\_\_\_\_ 13. Insufficient night work \_\_\_\_\_ 14. Started from large fires outside F. S. prot. area not threatening in its earlier stages \_\_\_\_\_ 15. Inaccessible areas, lack of roads or trails \_\_\_\_\_ 16. Remoteness from labor supply \_\_\_\_\_ 17. Extreme weather conditions (rare) \_\_\_\_\_  
18. Other \_\_\_\_\_  
Use of the following paragraphs, B to I, is required in Regions 1, 4, 5, 6; optional elsewhere (Make entries in paragraphs A and B only, if fire was handled by cooperator)  
B. DISCOVERY TIME: 1. If discovery time exceeds Regional Standard of 5 minutes, check reasons below. 2. Smoke not visible above tree tops  3. Lookout man failure \_\_\_\_\_ 4. Fire too far from lookout  5. Smoke or haze \_\_\_\_\_ 6. Lookout not occupied \_\_\_\_\_ 7. Fire at night \_\_\_\_\_ 8. Other \_\_\_\_\_  
C. REPORT TIME: 1. If report time exceeds the Regional Standard of 5 min., check reason. 2. Uncertain of existence or location of fire. 3. Telephone system out of order \_\_\_\_\_ 4. No one available to receive or transmit report \_\_\_\_\_ 5. Dispatcher seeking confirmation of location \_\_\_\_\_ 6. Other \_\_\_\_\_  
D. GET-AWAY TIME: 1. If get-away time exceeds the Regional Standard of 5 min., check reason. 2. Seeking confirmation \_\_\_\_\_ 3. Gathering men \_\_\_\_\_ 4. Stopping to eat \_\_\_\_\_ 5. Handling this fire as one of series \_\_\_\_\_ 6. Not prepared to go \_\_\_\_\_ 7. Why? \_\_\_\_\_ 8. Other \_\_\_\_\_  
E. TRAVEL TIME: 1. If elapsed travel time exceeds that set as standard on hour control map, or Regional Standard rates of travel, check reason. 2. Got lost \_\_\_\_\_ 3. Took wrong route \_\_\_\_\_ 4. Used wrong means of transportation \_\_\_\_\_ 5. Night travel across country \_\_\_\_\_ 6. Stopped to pick up men en route \_\_\_\_\_ 7. Loaded or stopped en route \_\_\_\_\_ 8. Location of fire erroneous \_\_\_\_\_ 9. Hunting for fire \_\_\_\_\_ 10. Work on other fire en route \_\_\_\_\_ 11. Average miles per hour 3 \_\_\_\_\_ 12. Was this satisfactory speed? yes \_\_\_\_\_ 13. Fire not chased by nearest man \_\_\_\_\_ If not, explain in "Remarks." 14. Other \_\_\_\_\_  
F. ATTACK TIME: 1. If there was delay between arrival at fire and start of work, check reason. 2. Setting up camp \_\_\_\_\_ 3. Going for help \_\_\_\_\_ 4. Hunting for clues \_\_\_\_\_ 5. Other \_\_\_\_\_  
G. LOSS OF LINE: 1. If any line lost, check reasons: 2. Improperly mopped up \_\_\_\_\_ 3. Improper location \_\_\_\_\_ 4. Not burned out clean \_\_\_\_\_ 5. High wind \_\_\_\_\_ 6. Lack of patrol \_\_\_\_\_ 7. Patrol not functioning \_\_\_\_\_ 8. Snags not felled \_\_\_\_\_ 9. Spot fires \_\_\_\_\_ 10. Poorly constructed line \_\_\_\_\_ 11. Failure to back-fire in time \_\_\_\_\_ 12. Other \_\_\_\_\_

Fill out in duplicate—one copy for Rangers, one for Supervisor's files

EXPLANATORY NOTES (READ CAREFULLY)  
"Other land"—Wherever used on this form indicates all non-National Forest lands, such as private, State, Indian, etc.  
"Protected land" includes all areas which are recognized by Federal or State agencies as being under organized protection.  
"N. F. Protection Unit"—An area under protection of the U. S. F. S. It may include some lands outside the National Forest.  
NONREPORTABLE (NONSTATISTICAL) FIRES  
Fires of the classes described below should not be included in the regular annual statistical records. If desired, however, for other uses, reports on some of these classes of fires may be required but should be conspicuously marked "nonreportable."  
1. Fires originating on area protected by Forest Service under the following circumstances:  
(a) Fires confined to private lands which are controlled by and reported to the State by owners or organized agencies other than the Forest Service which do or do not endanger National Forest or contributing private land, even if Forest officers investigate or inspect them or give assistance at no outlay by the Forest Service other than salaries and minor expenses of the regular administrative and protective forces.  
(b) Fires originating in burning buildings, haystacks, or sawdust piles, which do not spread or actually endanger National Forest protected lands.  
(c) Small fires, usually less than 1/4 acre, which spread from burning slash on Forest Service sales or improvement projects and which are suppressed by the crews in charge of the slash disposal. If handled by suppression crews they are reportable fires.  
(d) Spot or small fires usually less than 1/4 acre on either National Forest or private lands, started by lumbering or other industrial operations which are immediately extinguished by private employees hired for that purpose, such as watchmen at donkeys, patrolmen, etc.  
(e) Fires, usually less than 1/4 acre, spreading from lawful brush or slash fires confined to private lands which are controlled by agencies other than the Forest Service, even if Forest officers do contribute time or nominal expense to them.  
(f) Fires which can not spread to adjacent inflammable material from live coals of abandoned camp fires in prepared pits or fireplaces or in areas naturally devoid of fuel such as gravel bars.  
(g) Railroad fires: (1) Fires, usually less than 1/4 acre, on the right of way which burn out naturally or which are extinguished by railroad employees; (2) live coals found between the rails; (3) fires handled by other agencies, which spread from the right of way but which do not threaten National Forest or cooperative land protected by the Forest Service, even though Forest officers may contribute time to investigation or inspection or may render nominal assistance on the line; report being made to or by the State.  
(h) Fires, including lightning fires, less than 10 acres in size which are out when reached by the first fire fighter. This includes fires of this class discovered, searched for, and found or not found.  
(i) Spot fires and hang-over fires which escape after being controlled will not be reported as separate fires. Report original fire in the usual way and cover subsequent events under "Remarks."  
2. Fires in unprotected territory adjacent to the National Forest which do not enter the National Forest and do not require any cash outlay by the Forest Service. (The same policy as for 1 (a) above).  
3. Fires, usually less than 1/4 acre, in territory protected by other recognized agencies where Forest Service cooperation consists only of contributed time and nominal cash expense. Where such fires enter areas protected by the Forest Service or where substantial expenditures are made to protect National Forest interests, they are reportable, but the expense incurred by others and the burned acreage and damage on areas protected by others will not be included. This condition should be explained under "Remarks."  
NOTE.—All fires which occur outside the exterior boundaries of National Forest protection units and on which a Forest officer contributes a small amount of time and incurs no other expense are: (1) Reportable, if they endanger National Forest protection units and are not controlled by other parties; (2) non-reportable, if they do not endanger National Forest protection units; (3) nonreportable, if they do endanger National Forest protection areas and are controlled by others with the minor aid of Forest officers.  
F, 8, 9, 10. Insert the numbers of the preceding items which were used "successfully," for "mop up," etc., viz: "10. Mop up 2-3-6."  
F, 11.—DIRECT METHOD.—Working immediately at the edge of the fire (see the Glossary of Terms Used in Fire Control for more details).  
TWO-FOOT METHOD.—Building fire line not over 2 feet from edge of fire, usually not back-fired out.  
PARALLEL METHOD.—Building fire line parallel to but usually 6 to 100 feet from edge of fire and immediately burning out intervening strip.  
INDIRECT METHOD.—Building fire line considerable distance in advance of fire and then back-firing. Utilizes roads, rims, etc.  
MAP.—Outline boundaries of fires over 10 acres. Use (X) to indicate the point of origin. Indicate scale used. Show section numbers in center of squares. Indicate non-Federal land and show whether or not contributing. Indicate ownership of noncontributing land if information is available. Map all fires of 100 acres or more in size on a separate sheet, and show timber types, daily spread of fire, and contours if available from U. S. G. S. or other maps.  
LOCAL.—See the Glossary of Terms Used in Fire Control for terms not defined below.  
LOCAL.—Refers to people who live on or adjacent to the Forest, including small towns near by.  
TRAVELER.—Refers to any transient who can not be more definitely classified.  
ACTION TAKEN.—Be sure to supply all information called for in the elapsed time record.  
CONTROL LINE.—Give paced lengths, including only length of line upon which actual work was applied. Total perimeter is the total distance around the burned area, including both worked and unworked sections.  
Primary travel time=to first arrival at fire.  
WIND VELOCITY.—"Light," rustles leaves; "Gentle," sways small branches; "Moderate," sways large branches; "Strong," sways small trees; "Gale," breaks smaller branches.  
INCENDIARY FIRES.—The principle to govern in reporting on the many possible variations is: A group of fires set in close proximity to each other by the same party at one time will be given one name and reported on only one report as one fire, providing the "sets" could reasonably have been handled by the first attacking party as one fire, i. e., a fire line could reasonably have encompassed several of them as one fire. Otherwise, each "set" or group of sets will be reported as individual fires.  
NUMBERS OF SETS.—If several sets are handled as one fire and reported as one fire, state here the number of sets included in the group so reported. If separate reports are made for the sets do not show them here.  
"FIRE ACTIONABLE."—Fires starting or being allowed to spread in violation of laws or regulations, or where there is an implied agreement or statutory obligation to compensate the Forest Service for its work in suppressing such fires. A "nonreportable" fire may in some cases be "actionable."  
VISIBILITY.—Disregard whether or not the stations were occupied when this fire started. For definitions of "Direct," "Indirect," and "Blind" see the Glossary of Terms Used in Fire Control, 1930. Include as "fire control stations" all stations regularly depended upon for detection service—include per diem guards and other cooperators only for indirect visibility where so depended upon. Exclude all emergency guard stations.  
(B) ANALYSIS OF ACTION TAKEN.—Instructions regarding the method to be followed by the Supervisor in obtaining this information will be issued by each Regional Forester. 1. If two reasons are given for one fire, parenthesize the less important.  
8-7629

APPENDIX D

ILLUSTRATIONS OF FOREST MANAGEMENT PRACTICES

Fire Control

Timber Cutting

Logging Operations

Grazing Lands

All photographs by courtesy of the United States  
Forest Service



Fig. 1. What fire can do to a mountain watershed. An old burn in the spruce type of forest reveals the clear path of a forest fire. (Coconino National Forest.)



Fig. 2. Flagstaff desert: old cutting on private land; high stumps - no seed trees left - very little reproduction. Taken on Rogers Lake road about 3 miles south of junction with Highway 66. (Coconino National Forest, 1931.)



Fig. 3. Standard Lumber Company cutting area showing good type of seed trees, good brush piling and stump patches. (1925)



Fig. 4. Saginaw Manistee cuttings on private lands. No seed trees or young timber left, and snags left standing. (1927)



Fig. 5. Cutover Ponderosa pine on Menges Bros. Forest Service timber sale, Apache National Forest. Note reproduction of seedlings. (1928)



A. Loader at work on A. L. & T. Sale, Coconino National Forest.



B. Steam skidder working on timber cutting supervised by Forest Service, Tusayan National Forest. (1924)

Fig. 6. Logging operations on Arizona forests.



Fig. 7. The way logs are bunched on Loader road to be scaled and loaded on trucks. Gibson's Camp - A.L. & T. Co. Sale, Rogers Lake Unit, Coconino National Forest. (1936)



A. Desolation due to lack of seed trees.



B. Cutover area towards White Mountains, Sitgreaves National Forest.

Fig. 8. Contrasts in cutover lands, after supervised or unsupervised cutting.



Fig. 9. Cady Lumber Corporation Sale, Fulton Canyon unit, cut in 1926. Coconino National Forest.



Fig. 10. Typical gully erosion following overgrazing and reduction in vegetative cover.



Fig. 11. Coconino National Forest Rogers Lake grazing plot. Shows effect of protection from stock on reproduction. (1932)



A. Inside and outside the fence at 13 Ranch, Tonto National Forest. (1934)



B. Heavily grazed browse on the Arizona Apache Indian Reservation. (1935)

Fig. 12. Contrasts in grazing lands.

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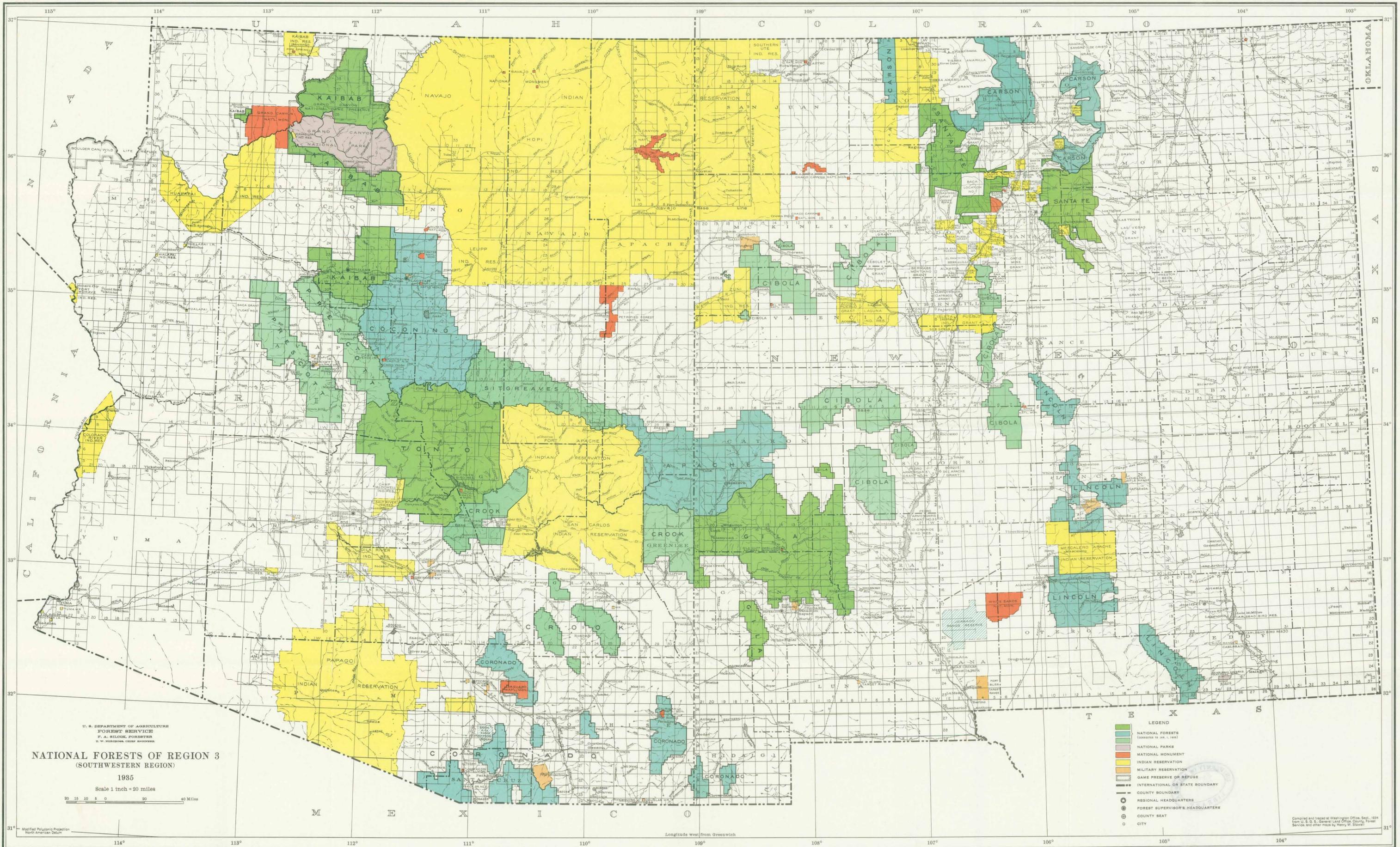
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U. S. DEPARTMENT OF AGRICULTURE  
 FOREST SERVICE  
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 V. W. WOODRUM, CHIEF ENGINEER

**NATIONAL FORESTS OF REGION 3**  
 (SOUTHWESTERN REGION)

1935

Scale 1 inch = 20 miles



- LEGEND**
- NATIONAL FORESTS (SUCCESSIVE TO JAN. 1, 1935)
  - NATIONAL PARKS
  - NATIONAL MONUMENT
  - INDIAN RESERVATION
  - MILITARY RESERVATION
  - GAME PRESERVE OR REFUGE
  - INTERNATIONAL OR STATE BOUNDARY
  - COUNTY BOUNDARY
  - REGIONAL HEADQUARTERS
  - FOREST SUPERVISOR'S HEADQUARTERS
  - COUNTY SEAT
  - CITY

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